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RAPTOR NEST MONITORING
IN THE
GREAT DIVIDE RESOURCE AREA
1998

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RAPTOR NEST MONITORING IN THE GREAT DIVIDE RESOURCE AREA

1998

BY

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NOVEMBER 10, 1998

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Erratum

The Y-axis for the 1993 graph on page 115 should read "# of Eggs Layed/Hatched Per Day" rather than "# of Eggs Layed Per Day".

RAPTOR MONITORING AND FERRUGINOUS HAWK BANDING IN THE GREAT DIVIDE RESOURCE AREA
1998

by
Larry Apple, Wildlife Biologist
Rawlins Field Office[1]

SUMMARY

The Great Divide Resource Area's (GDRA) 1998 raptor monitoring and inventory was the most extensive and coordinated effort in more than 15 years. Six volunteers, recruited this spring, worked in two major areas. The first was the Shamrock Hills Area of Critical Environmental Concern (ACEC) west of Rawlins. Two volunteers intensively monitored and inventoried all raptors nesting within this area. The other major area was the Continental Divide/Wamsutter II Oil and Gas EIS Area (CD/WII), located both north and south of Wamsutter. This latter area was divided into two monitoring units, one north and one south of Interstate 80 (I-80). Two volunteers were assigned to each area.

In addition to the general raptor monitoring, we monitored the activity at 91 artificial nesting structures (ANSs) built to attract ferruginous hawks (81 ANSs), golden eagles (nine ANSs), and red-tailed hawks (one ANS) away from nests susceptible to human disturbance. The first 30 ANSs were constructed in 1987 and the remaining 61 have been added during the past 10 years.

The 1998 nesting activity of ferruginous hawks, golden eagles, and other raptors is difficult, if not impossible, to compare to 1997 nesting levels. This is because the scope of the 1998 monitoring was much expanded over that accomplished in 1997. Eight known and three newly-discovered natural golden eagle nests were active, as were two artificial nesting structures (ANSs) built specifically for golden eagles. Fourty-six ferruginous hawk pairs used ANSs (38 pairs successfully layed eggs and raised young and eight pairs failed to produce eggs or abandoned the nests prior to laying eggs), two golden eagle ANSs were successfully used by ferruginous hawks, and 11 known and eight newly-discovered natural ferruginous hawk nests were active (14 successful and 5 failures). In total, we monitored 67 ferruginous hawk pairs attempting to nest within the Great Divide Resource Area. Fifty-four of these pairs successfully produced young. Thirteen pairs failed to produce eggs, abandoned nests with eggs, or lost young and consequently abandoned their nests. It should be stressed that there are undoubtedly many more successful and unsuccessful ferruginous hawk nesting pairs within the GDRA outside the areas we were able to monitor.

Another raptor project, in its sixth year, is a ferruginous hawk banding study. This study is designed to help understand more about the biology of this sensitive raptor and to help with future management decisions concerning the species.

This year we banded a total of 141 nestlings, bringing the six year total to 641 banded ferruginous hawks. In addition, 21 unbanded nestlings successfully

---

[1] The field work was accomplished while the administrative area was known as the Great Divide Resource Area (GDRA). On October 1, 1998 the name was officially changed to the Rawlins Field Office. References to the GDRA are used throughout the text. Future reports will reflect the new name.

fledged from six other nests. These nests were secure even from wildlife biologists, being either too high or too difficult reach.

Since the 1997 report, we have had no additional band recoveries. We hope to begin using leg bands stamped with the toll-free phone number for the banding lab in 1999. Hopefully this will encourage those who find a banded bird to report the band number. This year we observed the first adult ferruginous hawk with a white plastic leg band. After five previous years of banding nestlings, we finally confirmed the return of a locally-banded bird to the area as a breeding adult. We plan to continue the monitoring and banding projects for several more years.

All of the inventory and monitoring data collected this year will be included in the digitized data base maintained at this office. Many new nests were discovered, and many known nests were found to no longer exist. The corrections and updates to the data base will be completed prior to the beginning of the 1999 field season. All of this nest location information is currently on 7½" USGS topographic maps and is also maintained in the GIS data base. Maps depicting raptor nesting locations can be printed at any scale and for any area(s) from this data base.

U.S. Department of the Interior
Bureau of Land Management
Great Divide Resource Area
1300 N. 3rd Street
Rawlins, Wyoming 82301

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RAPTOR MONITORING AND FERRUGINOUS HAWK BANDING IN THE GREAT DIVIDE RESOURCE AREA
1998

by
Larry Apple, Wildlife Biologist
Great Divide Resource Area

PREFACE

The Great Divide Resource Area contains 14 Raptor Concentration Areas (RCA). Two of these are designated Areas of Critical Environmental Concern - Shamrock Hills west of Rawlins and Jep Canyon along the southwestern part of Atlantic Rim. This year, as in 1997, monitoring efforts were concentrated in the Shamrock Hills ACEC and in one other major area. Two volunteers (Scott Lilley and Mike Schulze) monitored all nests within the Shamrock Hills study area (Map 1). This monitoring entailed an intensive on-the-ground survey effort to determine the activity status and condition of all nests. All natural and artificial nests within the Shamrock Hills ACEC had been intensively monitored in 1997, the first year of recent concentrated monitoring. The purpose of the 1998 effort was both to continue to search for raptor nests within the ACEC study area and to monitor the activity of ferruginous hawks on artificial nesting structures and natural nests. These two volunteers also closely watched active ferruginous hawk nests to determine whether any adults had colored leg bands, indicating that they had been banded in the area when they were nestlings. The monitoring results are summarized in Part 1 of this report.

Four volunteers (Jody Simoes, Adam Nelson, Laura Barjaktaroic, and Ruthanne Watkinson) monitored raptor activity and determined nest status and condition in two separate parts of the Continental Divide/Wamsutter II, Creston Blue Gap, and Mulligan Draw EIS areas. Jody Simoes and Adam Neslon worked the project area north of I-80 (Map 2) and Laura Barjaktarovic and Ruthanne Watkinson worked south of I-80 (Map 3). The results of these monitoring efforts are described in Part 2 of the report.

Bob Tigner and I conducted general raptor nest monitoring throughout the GDRA on a limited, less-intensive basis (data included in Part 2). We surveyed both natural nests in close proximity to ANSs or near roads associated with ANS monitoring, and raptor nests associated with oil and gas drilling proposals.

All of the golden eagle and ferruginous hawk ANSs in the GDRA (both outside of and within the Shamrock Hills ACEC) were continuously monitored until their status could be determined. A summary of the status of all artificial nesting structures, and an eleven-year summary of ANS use is contained in Part 3.

Part 4 of this report details the 1998 ferruginous hawk banding activities. Because some readers may not have access to previous reports, a review and update of activities from the past 6 years is also included.

ACKNOWLEDGEMENTS

I would like to thank Bob Tigner for his assistance in monitoring the activity status of many of the ferruginous hawk ANSs and natural nests in 1998. Bob has been involved with the raptor monitoring and ANS placement throughout the Great Divide Resource Area since the project began in 1987. I greatly appreciate his interest in birds of prey and his dedication to BLM's raptor monitoring and hawk banding projects. I also thank him for initially including me in this work in 1993.

The scope of the inventory and monitoring efforts could not have been possible without the help of six very energetic and enthusiastic volunteers. Scott Lilley and Mike Schulze thoroughly surveyed the Shamrock Hills ACEC and study area, updating the status of almost 300 nests. Their work resulted in a very complete examination of the study area.

Jody Simoes and Adam Nelson surveyed the CD/WII area north of I-80. Their area has fewer nests than the other two areas, but these nests are much more widely-scattered. Adam and Jody surveyed 170 nests in an area covering over 800,000 acres.

Laura Barjaktarovic and Ruthanne Watkinson worked as a team to survey the CD/GWII area south of I-80. Their area was large and had more scattered and concentrated clusters of nests. They surveyed an area over 730,000 acres and assessed the status of approximately 300 nests.

I want to thank each volunteer individually for their energy, enthusiasm, and eagerness to successfully complete the project. Without their efforts, much of this data could not have been collected.

I would also like to thank Steve Hoffman and Paul Grindrod of HawkWatch International, a non-profit, worldwide raptor advocacy organization, who served as my "recruiting agency" for the volunteer project. They spent many hours soliciting applicants for the project and interviewing and screening those who best met the position requirements. They saved me many, many hours and brought tremendous expertise to what I consider a difficult task: recruiting qualified volunteer support.

PART 1

Raptor Monitoring in the Shamrock Hills ACEC, 1998
With a Project Update, 1987 - 1998

The Shamrock Hills, located approximately 8 miles (13 kilometers) west of Rawlins, Wyoming, has one of the highest known nesting populations of ferruginous hawks within Wyoming (Map 1). Ferruginous hawks are thought to be the least numerous of all North American buteos, or broad-winged, soaring hawks.

During the last 11 years, there have been two unsuccessful attempts to develop the coal resources within the Shamrock Hills ACEC through a process called underground coal gasification. The scope of the proposed coal gasification project would have directly affected many natural ferruginous hawk nesting sites. Some natural nest sites would have been destroyed by the development of the project, others would have been abandoned, and others would have failed because of their proximity to construction or maintenance activities.

In response to development plans, 30 artificial nesting structures (ANSs) were assembled and located at sites where they would hopefully not be disturbed by current or future development activity. The ANSs were intended to be mitigation for disturbance, in anticipation of fullscale operation of the gasification project. Although neither project proceeded from the demonstration phase into commercial production, the current, available technology is suitable for a similar project to be successful. Another company may attempt to develop this coal resource in the future.

Comprehensive raptor monitoring was done in the Shamrock Hills. During the nesting seasons of 1988, 1989, 1994 and 1995 Mayo Call, PhD, conducted comprehensive raptor monitoring in the Shamrock Hills under a contract with both development companies. These data are included in the maps in Appendix 1A.

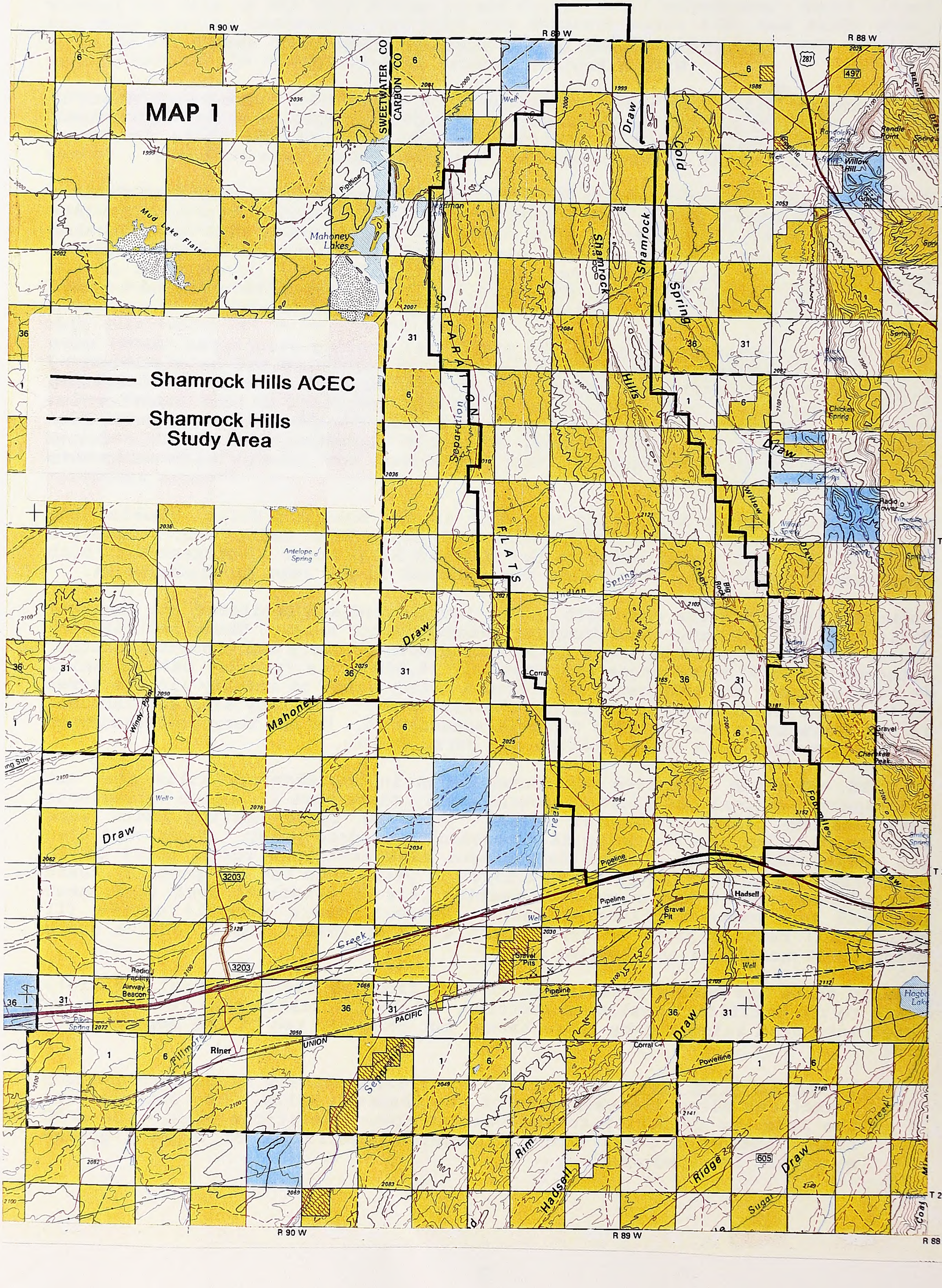
Volunteers Mike Schulze and Scott Lilley inventoried and monitored the Shamrock Hills ACEC for all active and inactive natural raptor nests. Their initial task was to monitor all natural nests to determine both activity and condition status. Although the ACEC encompasses approximately 36,500 acres (roughly half of which is public land), the volunteers monitored a "study area" of roughly 110,000 acres (both public and private lands in the checkerboard). The study area is described in the Ferruginous Hawk Banding Study in Appendix 4A. We had very good landowner cooperation from both John Stratton and Jerry Faddis.

In 1988, when the intensive monitoring began in the Shamrock Hills area (in anticipation of coal gasification development), there were 19 active ferruginous hawk nesting pairs on natural nests. Five of these nesting pairs were unsuccessful, but the remaining 14 successfully fledged young. There were also six active ANSs which fledged ferruginous hawk nestlings for a total of 20 active/successful nesting pairs. In 1998, 11 years into the ANS program, there was only one active and successful nesting pair on a natural nest (this nest produced two young to fledging age). However, there were 14 active (11 successful) nesting pairs of ferruginous hawks on ANSs. The 11 active nests produced 30 nestlings to fledging age.

Clearly there has been a dramatic shift away from the use of natural substrate nests to the artificial nesting structures. There are likely many factors which enter into nest selection by these hawks, but probably two of the more obvious are:

1. Location of Prey: The natural nests are primarily in the rock outcrop formations along the east side of the Shamrock Hills. The placement of the ANSs was primarily to the west at lower elevations within the ACEC along Separation Creek where a larger concentration of Wyoming ground squirrels is found, and:

MAP 1


Shamrock Hills ACEC
Shamrock Hills Study Area
R 90 W
R 89 W
R 88 W
T 23 N
T 22 N
T 21 N
T 20 N
SWEETWATER CO
CARBON CO
Mud Lake Flats
Mahoney Lakes
SEPARATION FLATS
Separation
Shamrock Hills
Shamrock Draw
Cold Spring Draw
Willow
Indian Spring Creek
Big Rock
Antelope Spring
Windy Point
Mahoney Draw
Corral
Creek
Pipeline
Well
Hadsell
Gravel Pit
Gravel Pits
Radio Facility Airway Beacon
UNION PACIFIC
Riner
Fillmore
Powerline
Rendle Point
Randolph Spring
Willow Hill
Radio Tower
Chicken Spring
Cherokee Peak
Fourmile Draw
Smiley Spring
Hogback Lake
Rim
Hadsell Ridge
Sugar Draw
Creek
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2. Security of Nests: The ANS provides a nesting site more secure from predators. Many of the natural sites are easily approached by any mammalian predator and consequently are more likely to fail. Birds which choose to use the ANSs tend to experience fewer predation problems, and it is plausible to assume that they remember this and select these structures in subsequent nesting seasons.

The yearly nesting maps provided in Appendix 1A graphically demonstrate the shift from natural nesting sites to the ANSs from 1988 through 1998.

Within the study area, a total of 297 natural and artificial raptor nests (all species) were searched for in 1998. Nine nests included in the monitoring report were not checked but were assumed to be inactive because of their proximity to active ANSs.

Of the 237 natural ferruginous hawk nests monitored, only three were active (one used by a ferruginous hawk and two used by golden eagle pairs (see Table 1A). The ferruginous hawk was nest # FH22892103 which produced two young to fledging age. These young were banded and are included in the discussion on banding later in this report. This nest was active in 1996 along with two other natural nests, but was the only active natural nest in 1997. The two golden eagle pairs were both using ferruginous hawk nests. The volunteers determined that 15 ferruginous hawk nests previously surveyed have deteriorated over the years and recommended that the nests be removed from the inventory. The monitoring results for all individual nests surveyed within the Shamrock Hills study area in 1998 is found in Appendix 1B.

TABLE 1A
SUMMARY OF RAPTOR NESTS MONITORED
IN THE SHAMROCK HILLS ACEC STUDY AREA
1998

Species	Total # of Known Nests Searched For	# of Known Nests Found; not Active	# of Known Nests No Longer There	# of Known Nests not Found	# of Known Nests Found Active	# of New Nests Found Active	# of New Nests Not Active	# of Active Nests Abandoned Or Failed
Ferruginous Hawk	237	191[1]	15	20	3[2]	0	8	0
Ferruginous Hawk ANS[3]	33	19	0	0	14	0	0	3
Golden Eagle	13	11	0	0	0	0	2	0
Prairie Falcon	4	1	0	2	0	1	0	0
American Kestrel	4	0	0	2	2	0	0	0
Red-Tailed Hawk	1	1	0	0	0	0	0	0
Burrowing Owl	1	0	0	0	1	0	0	0
Northern Harrier	1	0	1	0	0	0	0	0
Swainson's Hawk	1	1	0	0	0	0	0	0
Unidentified Raptor	2	1	0	1	0	0	0	0
Totals	297	225	16	25	20	1	10	3

[1] Includes nine nests assumed inactive because of proximity to active ANSs; not checked.
[2] One nest was used by ferruginous hawks and two nests were used by golden eagles in 1998.
[3] Artificial nesting structure for ferruginous hawks.

In addition to the one active natural ferruginous hawk nest, there were 14 ferruginous hawk ANSs active this year. Eleven of these ANSs successfully produced young and three were abandoned before any eggs were laid. A more complete evaluation of these structures is presented in Part 4 of this report.

The volunteers also closely monitored the active nests to determine whether any of the adults had colored leg bands, indicating that they had been banded in the area as nestlings. This occurred primarily after we had visited the nests to determine the number and ages of the young. The task proved difficult because the adults flushed from the nest in most cases before the volunteers could get close enough to observe them through a spotting scope. Mike and Scott were able to observe several adults from a close enough distance and for a long enough time, but could not be sure if bands were present or absent. This was frustrating because we were not sure whether the bands were present and it was too difficult to see them, or whether indeed the bands were absent. It was not until a white plastic leg band was observed by one of the other volunteers, which I later confirmed, that we felt comfortable with the conclusion that none of the birds observed in the Shamrock Hills ACEC study area had plastic leg bands.

Mike and Scott confined their band observations to the latter part of the nesting cycle after we had visited the nests to determine nestling numbers and ages (as I had directed). They felt that the adults were much more intolerant of human presence than before the individual nest visits. They recommended that leg band searches take place during the early part of the nesting cycle before we visited the individual nests to check on nestlings. Prior to the nest visits, the adult hawks were more tolerant of an observer several hundred yards away. After the nest visits the adults were very easily distressed. The suggestion will be incorporated into the project in 1999.

APPENDIX 1A

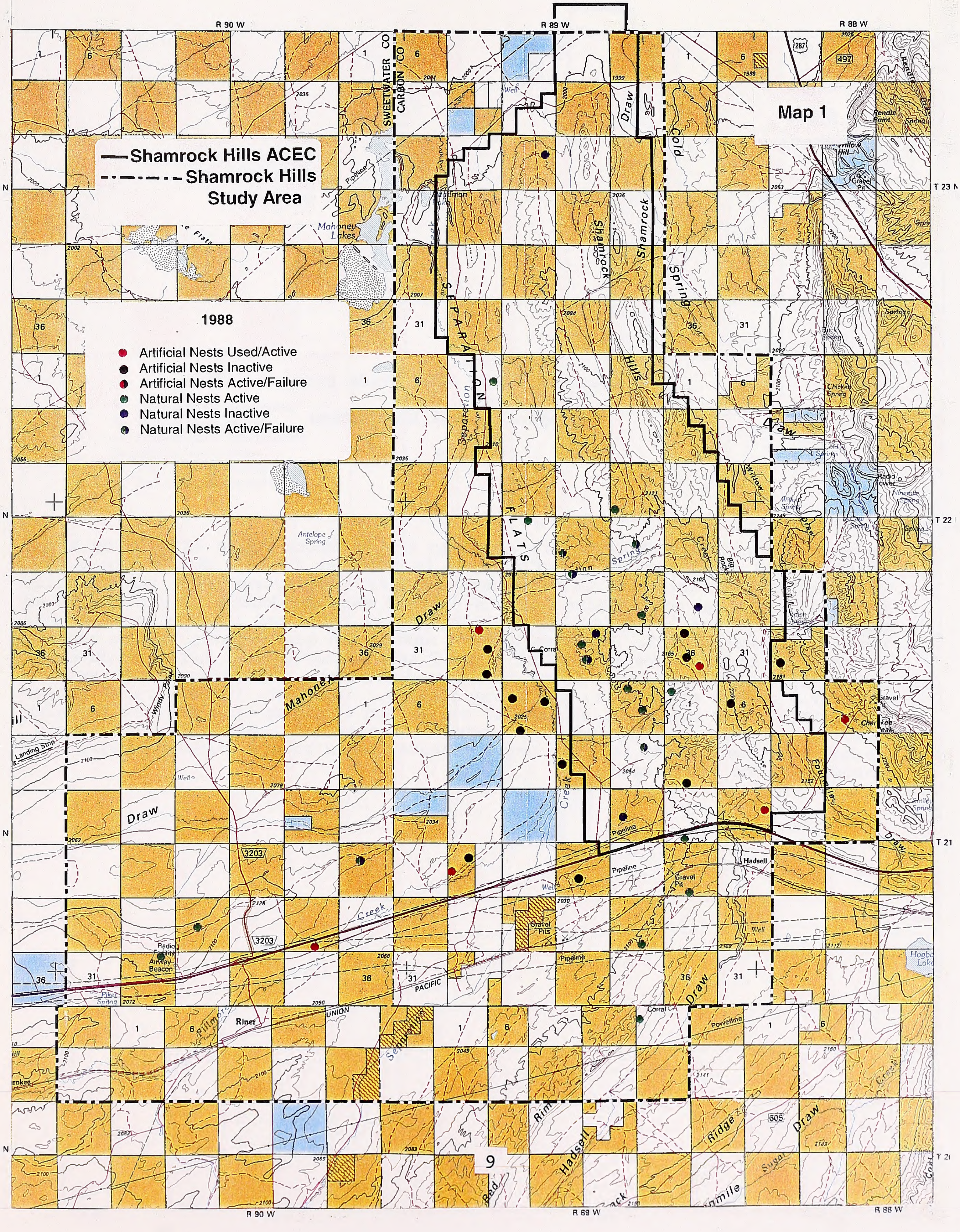
FERRUGINOUS HAWK NESTING ACTIVITY
SHAMROCK HILLS ACEC STUDY AREA MAPS
1988 - 1998

Shamrock Hills ACEC Study Area

Ferruginous Hawk Monitoring

1988

In 1988 there were 19 artificial nesting structures (ANSs) available for use and scattered throughout the Shamrock Hills ACEC Study Area. Only 6 of the 19 ANSs were active, but all 6 successfully produced young. Fifteen nestlings fledged from these 6 ANSs. In addition to the ANSs there were 19 natural nests which were active in 1988, with 13 nests successfully producing 39 young. The 6 natural nests that were unsuccessful, were abandoned or failed for undetermined reasons. In all, there were 25 actively defended ferruginous hawk territories within the Shamrock Hills ACEC Study Area in 1988, and 19 of these were successful, producing 54 young to fledging age. No nest mortalities were documented.

Map 1
Shamrock Hills ACEC
Shamrock Hills Study Area
1988
● Artificial Nests Used/Active
● Artificial Nests Inactive
● Artificial Nests Active/Failure
● Natural Nests Active
● Natural Nests Inactive
● Natural Nests Active/Failure
R 90 W
R 89 W
R 88 W
T 23 N
T 22 N
T 21 N
T 20 N
SWEETWATER CO
CARBON CO
Mahoney Lakes
Separation Flats
Separation Creek
Shamrock Draw
Shamrock Hills
Cold Spring Draw
Willow Creek
Big Rock
Antelope Spring
Mahoney Draw
Corral
Pipeline
Hadsell
Gravel Pit
Gravel Pits
Landing Strip
Windy Point
Radio Facility Airway Beacon
Creek
Union Pacific
Riner
Fillmore
Powerline
Chicken Spring
Radio Tower
Cherokee Peak
Rendle Point
Willow Hill
Hogback Lake
Red Rim
Hadsell Ridge
Sugar Creek
Ninemile Draw
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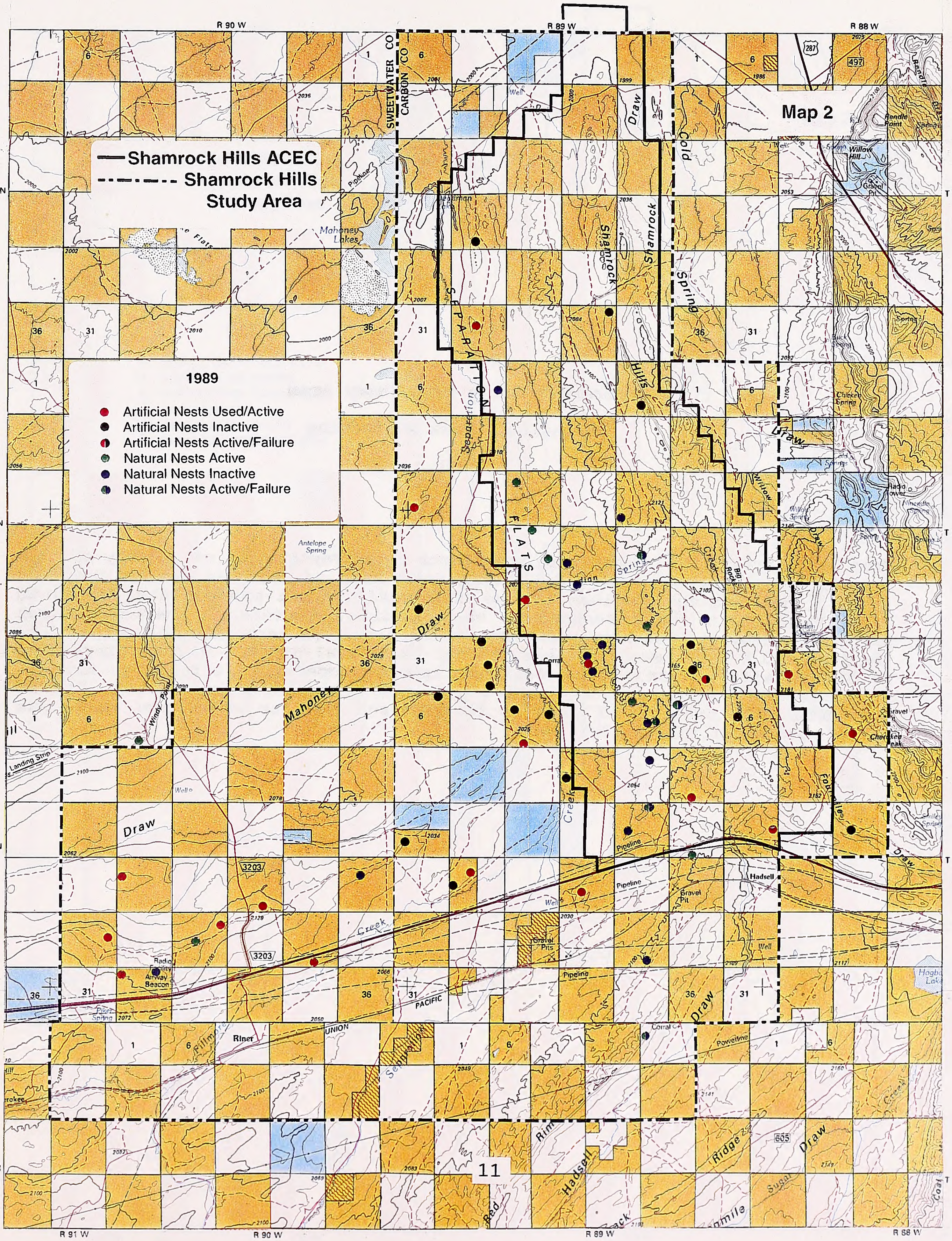
Shamrock Hills ACEC Study Area

Ferruginous Hawk Monitoring

1989

In 1989, ~~18~~ 16 additional ANSs were added to the Shamrock Hills ACEC Study Area, bringing the total available for nesting in the area to 35. While only 6 were used in 1988, a total of 18 were used in 1989. Seventeen ANSs successfully produced 43 young to fledging age and one ANS was abandoned. Almost twice as many ANSs were available for use in 1989 than in 1988, and 3 times as many ANSs were successfully used. Thirteen natural nests were active early in the nesting season, but only 7 were successful. The 7 successful natural nests produced 22 young (1 nestling was later found dead near its nest). One ANS was successfully used by a golden eagle pair, producing 1 young. In total, there were 31 active ferruginous hawk nests, 24 successful nests, and 64 young that reached fledging age. No nesting mortalities were reported or observed. With the 1989 season, we begin to see a shift from the use of natural nests to predominately using ANSs throughout the study area.


Map 2
Shamrock Hills ACEC
Shamrock Hills Study Area
1989
● Artificial Nests Used/Active
● Artificial Nests Inactive
◐ Artificial Nests Active/Failure
● Natural Nests Active
● Natural Nests Inactive
◐ Natural Nests Active/Failure
R 90 W
R 89 W
R 88 W
R 91 W
T 23 N
T 22 N
T 21 N
T 20 N
SWEETWATER CO
CARBON CO
Mahoney Lakes
Separation
SEPARATION FLATS
Shamrock
Shamrock Hills
Cold Spring
Draw
Willow Draw
Chicken Spring
Willow Hill
Rendle Point
Antelope Spring
Windy Point
Landing Strip
Mahoney Draw
Creek
Corral
Pipeline
Hadsell
Gravel Pit
Gravel Pits
Radio Facility
Airway Beacon
Piper Spring
Riner
UNION PACIFIC
Seminoe
Cherokee Peak
Fillmore
Powerline
Rim
Hadsell
Ridge
Red
Sugar
Hogback Lake
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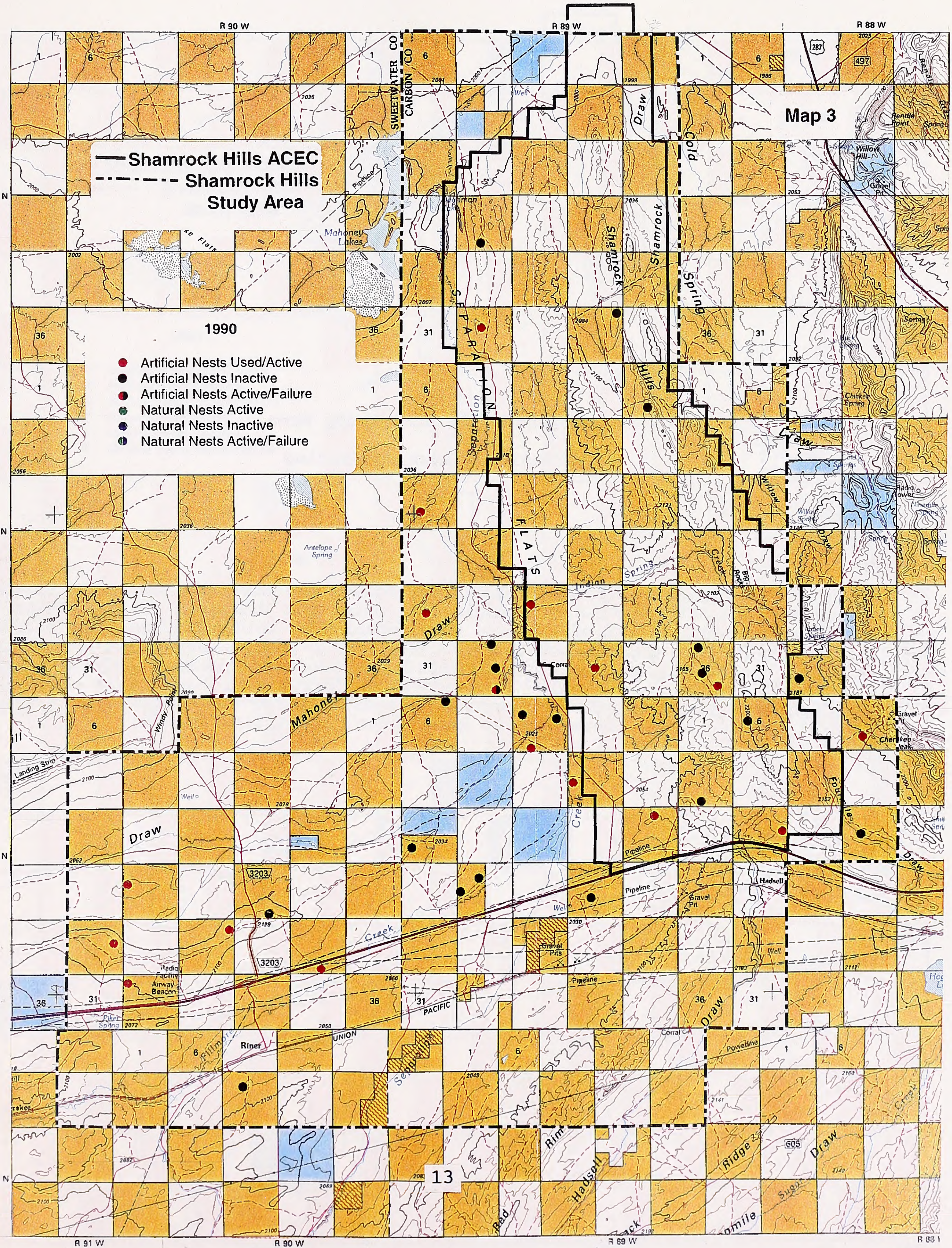
Shamrock Hills ACEC Study Area

Ferruginous Hawk Monitoring

1990

From 1990 through 1993 there were no efforts to survey all of, or as many of, the natural nests in the Shamrock Hills ACEC Study Area as had been done in previous years. The company involved in the coal gasification project had failed to demonstrate that their technology was feasible. Therefore, they no longer provided a biologist to survey raptors in the area. We were only able to monitor the ANSs and a very few of the easy-to-get-to natural nests. In 1990 there were 36 ANSs available for use by nesting raptors (hopefully ferruginous hawks). Seventeen ANSs were initially active and only 1 nesting pair failed. The 16 successful ANSs produced 41 young to fledging age. As far as we know, there was no nesting mortality in 1990.


Map 3
Shamrock Hills ACEC
Shamrock Hills Study Area
1990
● Artificial Nests Used/Active
● Artificial Nests Inactive
● Artificial Nests Active/Failure
● Natural Nests Active
● Natural Nests Inactive
● Natural Nests Active/Failure
R 91 W
R 90 W
R 89 W
R 88 W
T 23 N
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SWEETWATER CO
CARBON CO
SEPARATION FLATS
Separation
Shamrock Hills
Shamrock Draw
Cold Spring Draw
Willow Draw
Mahoney Lakes
Mahoney Draw
Antelope Spring
Draw
Windy Point
Landing Strip
Creek
Gravel Pits
Radio Facility
Airway Beacon
Piker Spring
Riner
UNION PACIFIC
Hadsell
Pipeline
Powerline
Corral
Chicken Spring
Radio Tower
Cherokee Peak
Gravel Pit
Willow Hill
Rendle Point
Bad Rim
Hadsell Ridge
Sugar Draw
Big Rock
Fourmile Draw
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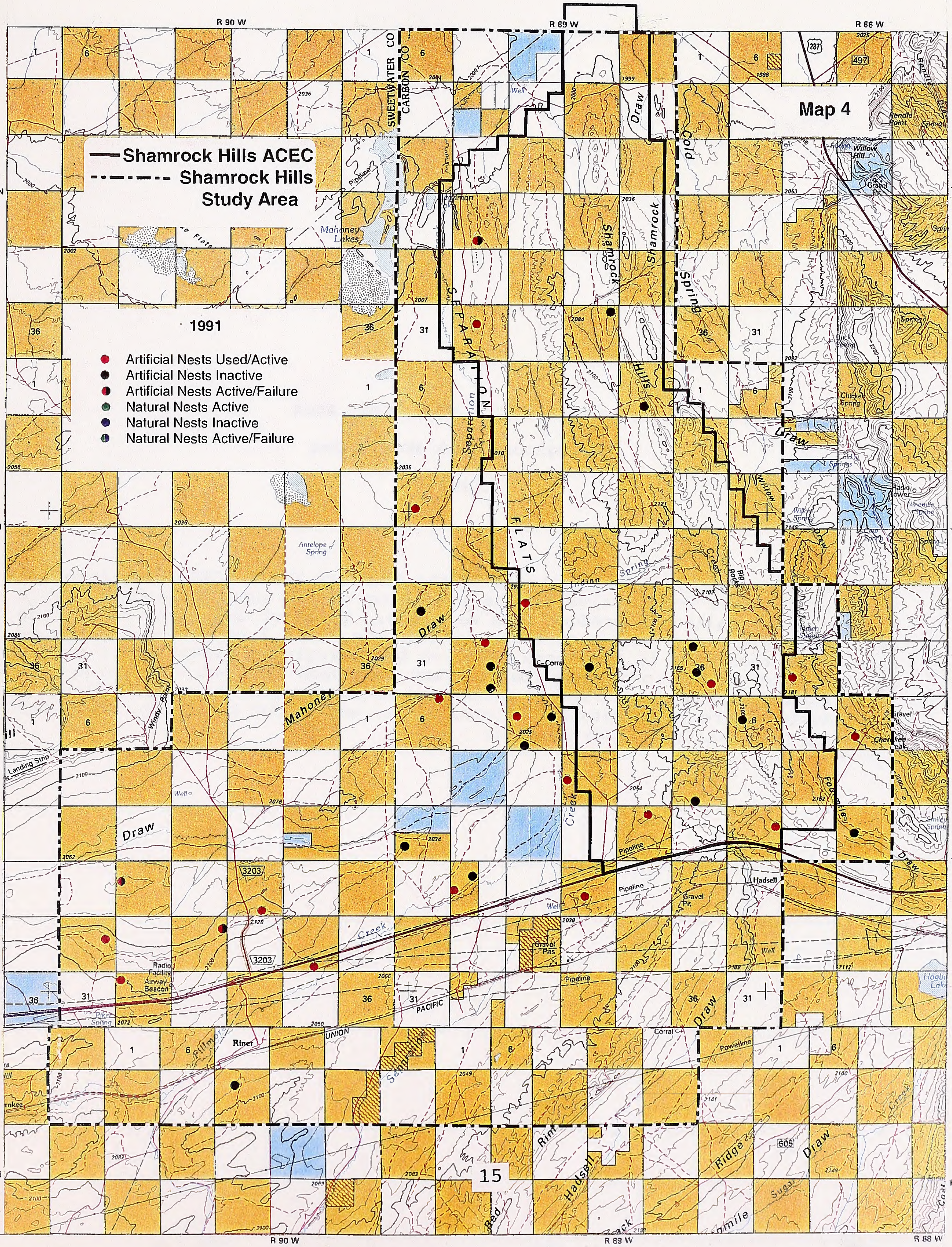
Shamrock Hills ACEC Study Area

Ferruginous Hawk Monitoring

1991

Prior to the beginning of the 1991 nesting season one more ANS was built in the Shamrock Hills ACEC Study Area bringing the total for that year to 37. Twenty-one ANSs were active, and of these, 4 were occupied by golden eagles. One golden eagle pair failed, and the other 3 each produced 1 young. Seventeen ANSs were occupied by ferruginous and 16 successfully produced young. One ANS was abandoned for unknown reasons. The successful ferruginous hawk pairs produced 37 young from 16 nests. No information is available for use or production from natural nests. Also, there were no known nest mortalities in 1991.


Map 4
Shamrock Hills ACEC
Shamrock Hills Study Area
1991
● Artificial Nests Used/Active
● Artificial Nests Inactive
● Artificial Nests Active/Failure
● Natural Nests Active
● Natural Nests Inactive
● Natural Nests Active/Failure
R 90 W
R 89 W
R 88 W
T 23 N
T 22 N
T 21 N
T 20 N
SWEETWATER CO
CARBON CO
SEPARATION FLATS
Shamrock Hills
Shamrock Draw
Cold Spring
Mahoney Lakes
Mahoney Draw
Antelope Spring
Windy Point
Landing Strip
Rendle Point
Willow Hill
Chicken Spring
Willow Draw
Indian Spring Creek
Big Rocks
Cherokee Peak
Fort Steele Draw
Hadsell
Gravel Pit
Gravel Pits
Pipeline
Radio Facility Airway Beacon
Riner
Pike Spring
UNION PACIFIC
Separation Creek
Powerline
Rim
Hadsell
Red
Ridge
Draw
Sugar
Hoglan Lake
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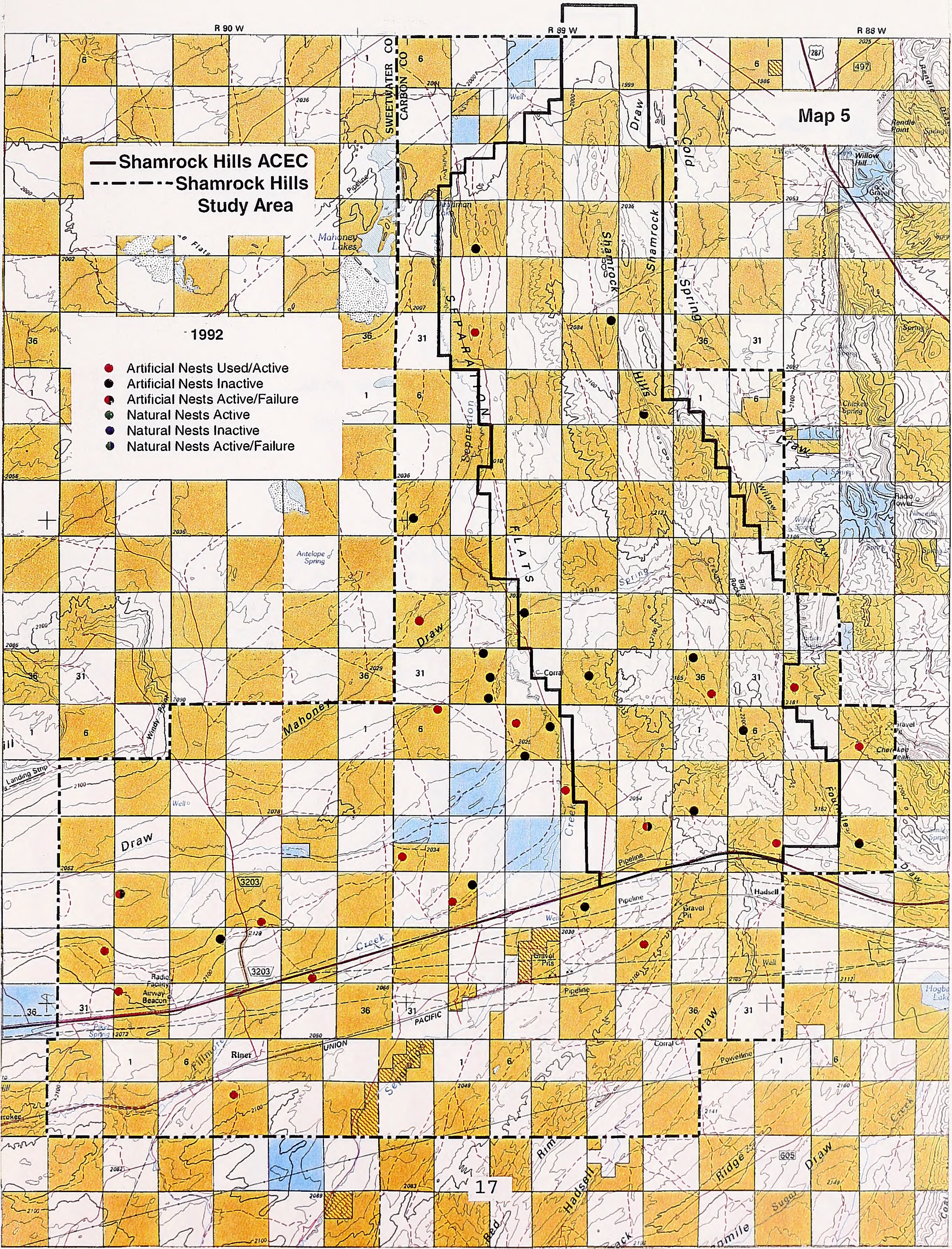
Shamrock Hills ACEC Study Area

Ferruginous Hawk Monitoring

1992

In 1992 there were 37 ANSs available in the Shamrock Hills ACEC Study Area. A total of 19 ANSs were active at the beginning of the nesting season, but 2 nesting pairs failed to produce eggs or young. Three of the total of 19 were used by golden eagles and 1 of these failed, the other 2 producing one eaglet each. The remaining 16 ANSs were occupied by ferruginous hawks, but 1 of the nesting pairs failed to produce young. They abandoned the nest with three eggs in it for unknown reasons. The 15 successful ANSs produced 39 young to fledging age. Again, there is no data for natural nests, and to our knowledge, there was no nesting mortality on ANSs in 1991.

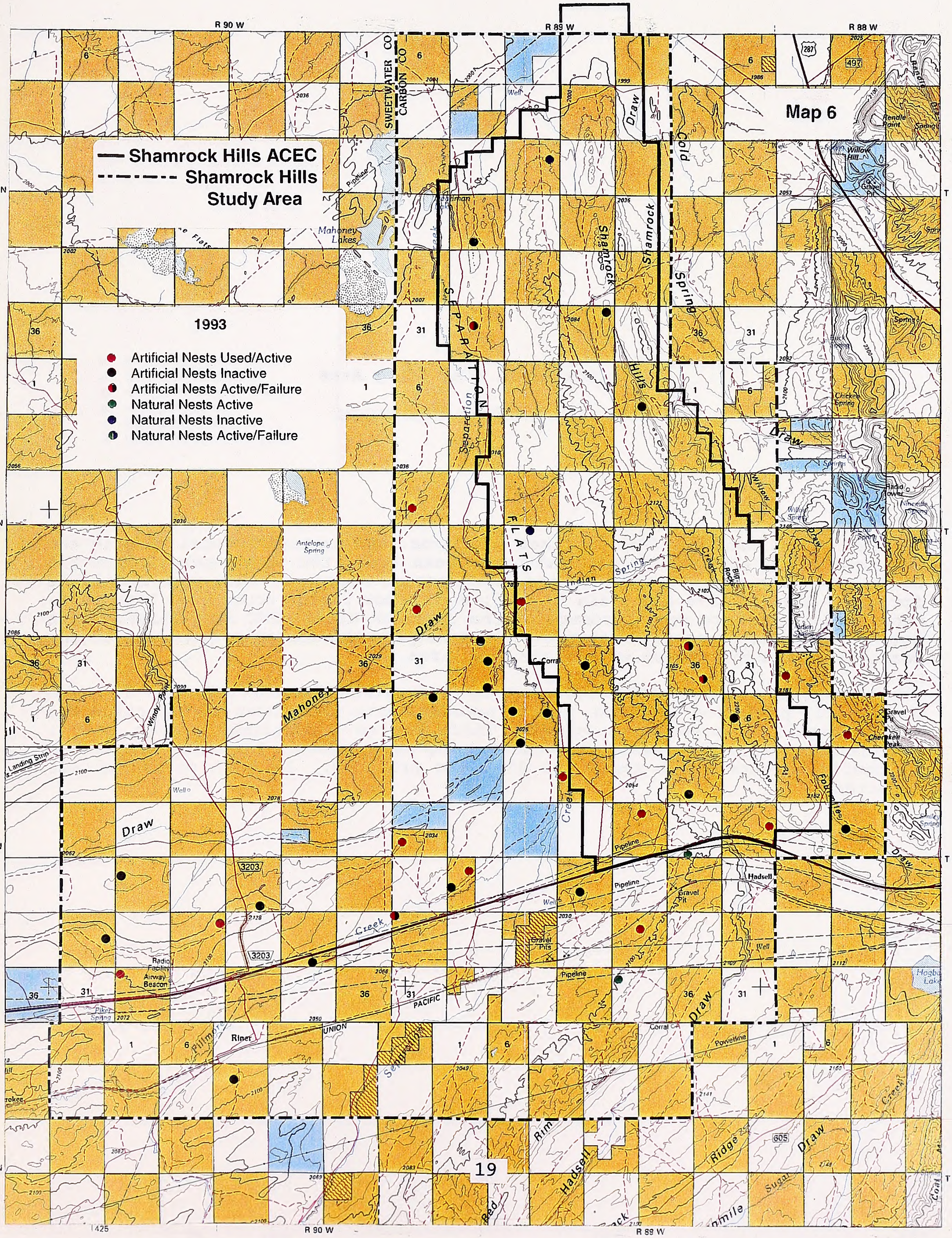

Map 5
Shamrock Hills ACEC
Shamrock Hills Study Area
1992
● Artificial Nests Used/Active
● Artificial Nests Inactive
● Artificial Nests Active/Failure
● Natural Nests Active
● Natural Nests Inactive
● Natural Nests Active/Failure
R 90 W
R 89 W
R 88 W
T 23 N
T 22 N
T 21 N
T 20 N
SWEETWATER CO
CARBON CO
SEPARATION FLATS
Separation
Shamrock Draw
Shamrock Hills
Cold Spring
Mahoney Lakes
Mahoney Draw
Antelope Spring
Willow Draw
Chicken Spring
Radio Tower
Rendle Point
Willow Hill
Gravel Pit
Corral
Hadsell
Riner
Pipeline
Powerline
UNION PACIFIC
Landing Strip
Radio Facility Airway Beacon
Windy Point
Fillmore
Gravel Pits
Hadsell Rim
Ridge
Sugar Creek
Hogback Lake
287
497
3203
605

Shamrock Hills ACEC Study Area

Ferruginous Hawk Monitoring

1993

Prior to the 1993 nesting season, one additional ANS was placed in the Shamrock Hills ACEC Study Area bringing the total available for use in 1993 to 38. Seventeen ANSs were used, but at only 13 did ferruginous hawks successfully produce young. Twelve of the 13 successful nests produced 32 young (the production from the 13th nest was not recorded). Two natural nests were known to be active and 5 young were produced. In all, there were 15 successful nesting ferruginous hawk pairs that produced 37 nestlings. There was no nesting mortality reported.


Map 6
Shamrock Hills ACEC
Shamrock Hills Study Area
1993
● Artificial Nests Used/Active
● Artificial Nests Inactive
● Artificial Nests Active/Failure
● Natural Nests Active
● Natural Nests Inactive
● Natural Nests Active/Failure
R 90 W
R 89 W
R 88 W
T 23 N
T 22 N
T 21 N
T 20 N
SWEETWATER CO
CARBON CO
Mahoney Lakes
Separation Flats
Separation Creek
Shamrock Hills
Shamrock Draw
Cold Spring Draw
Willow Creek
Big Rock Creek
Indian Spring
Antelope Spring
Chicken Spring
Cherokee Peak
Rendle Point
Willow Hill
Radio Tower
Mahoney Draw
Windy Point
Landing Strip
Radio Facility Airway Beacon
Piker Spring
Riner
Hadsell
Gravel Pit
Gravel Pits
Pipeline
Powerline
UNION PACIFIC
Corral
Sugar Creek
Red Rim
Hadsell Ridge
Separation Creek
Fillmore
Hogback Lake
287
497
3203
605

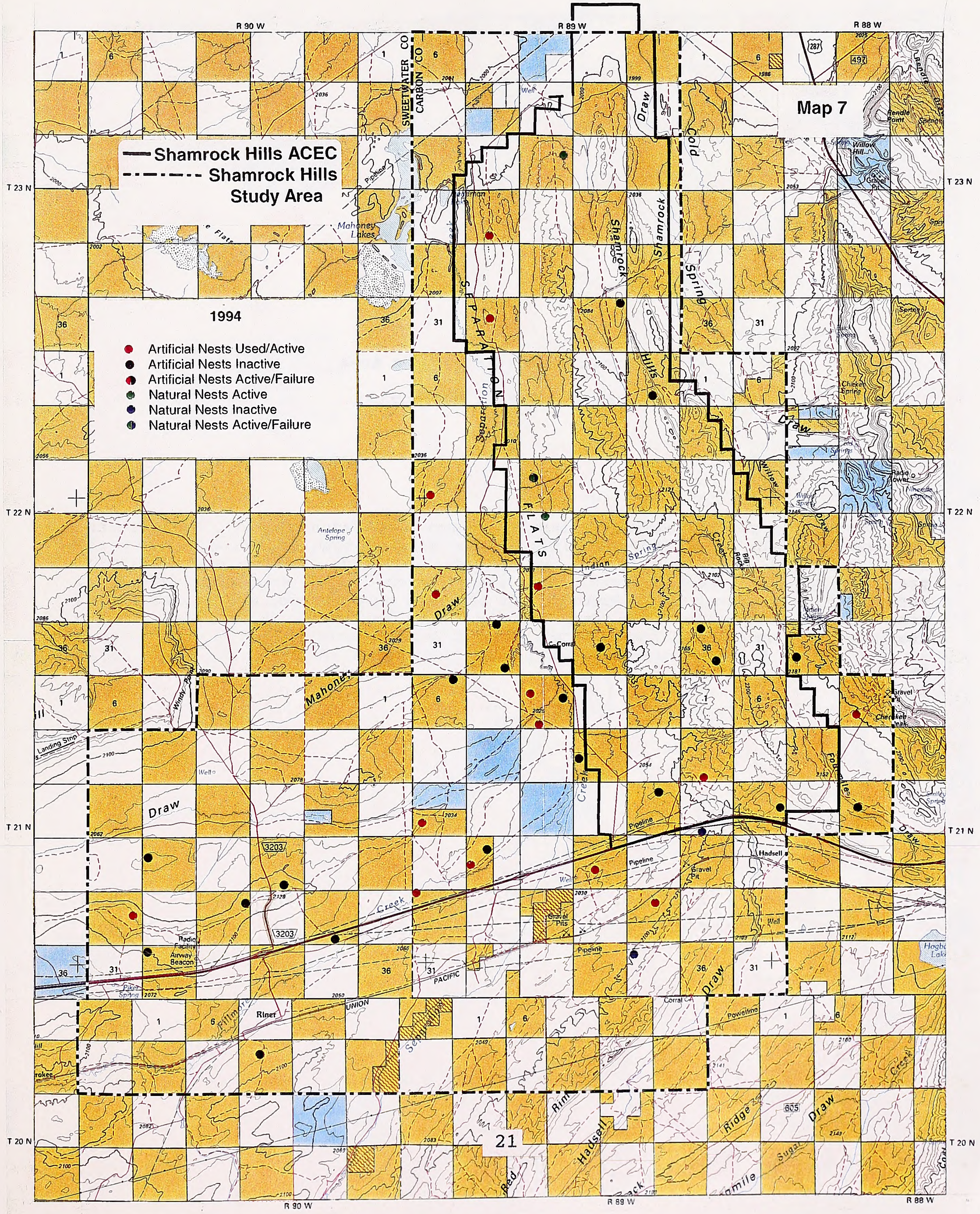
Shamrock Hills ACEC Study Area

Ferruginous Hawk Monitoring

1994

Because of the need for ANSs in other locations, and because several ANSs in the Shamrock Hills ACEC Study Area had never been used, two were removed from the study area. At the beginning of the 1994 nesting season 36 ANSs were available for use. Also in 1994 and again in 1995, a contract raptor ecologist, Mayo Call, conducted a complete raptor survey of the Shamrock Hills ACEC Study Area. This occurred because of another attempt to demonstrate the economic viability of the coal gasification process within the ACEC area.

There were 15 active ANSs occupied by ferruginous hawks and all 15 were successful, producing 42 young. Three natural nests were known to be active and two successfully produced 5 young. There was an unconfirmed report that 1 additional natural nest was active and 3 young were raised. In total, there were 17 confirmed successful nests and 47 young produced. No nest mortality was reported.


Map 7
Shamrock Hills ACEC
Shamrock Hills Study Area
1994
● Artificial Nests Used/Active
● Artificial Nests Inactive
● Artificial Nests Active/Failure
● Natural Nests Active
● Natural Nests Inactive
● Natural Nests Active/Failure
R 90 W
R 89 W
R 88 W
T 23 N
T 22 N
T 21 N
T 20 N
SWEETWATER CO
CARBON CO
SEPARATION FLATS
Separation Draw
Shamrock Hills
Shamrock Draw
Cold Spring Draw
Willow Draw
Indian Spring Creek
Big Rock
Mahoney Lakes
Mahoney Draw
Antelope Spring
Windy Point
Landing Strip
Radio Facility
Airway Beacon
Piker Spring
Riner
Fillmore
UNION PACIFIC
Pipeline
Powerline
Gravel Pits
Gravel Pit
Corral
Well
Hadsell
Red Rim
Hadsell Ridge
Sugar Creek
Draw
Rendle Point
Willow Hill
Chicken Spring
Radio Tower
Ninemile Spring
Cherokee Peak
Hogback Lake
Smiley Spring
3203
287
497
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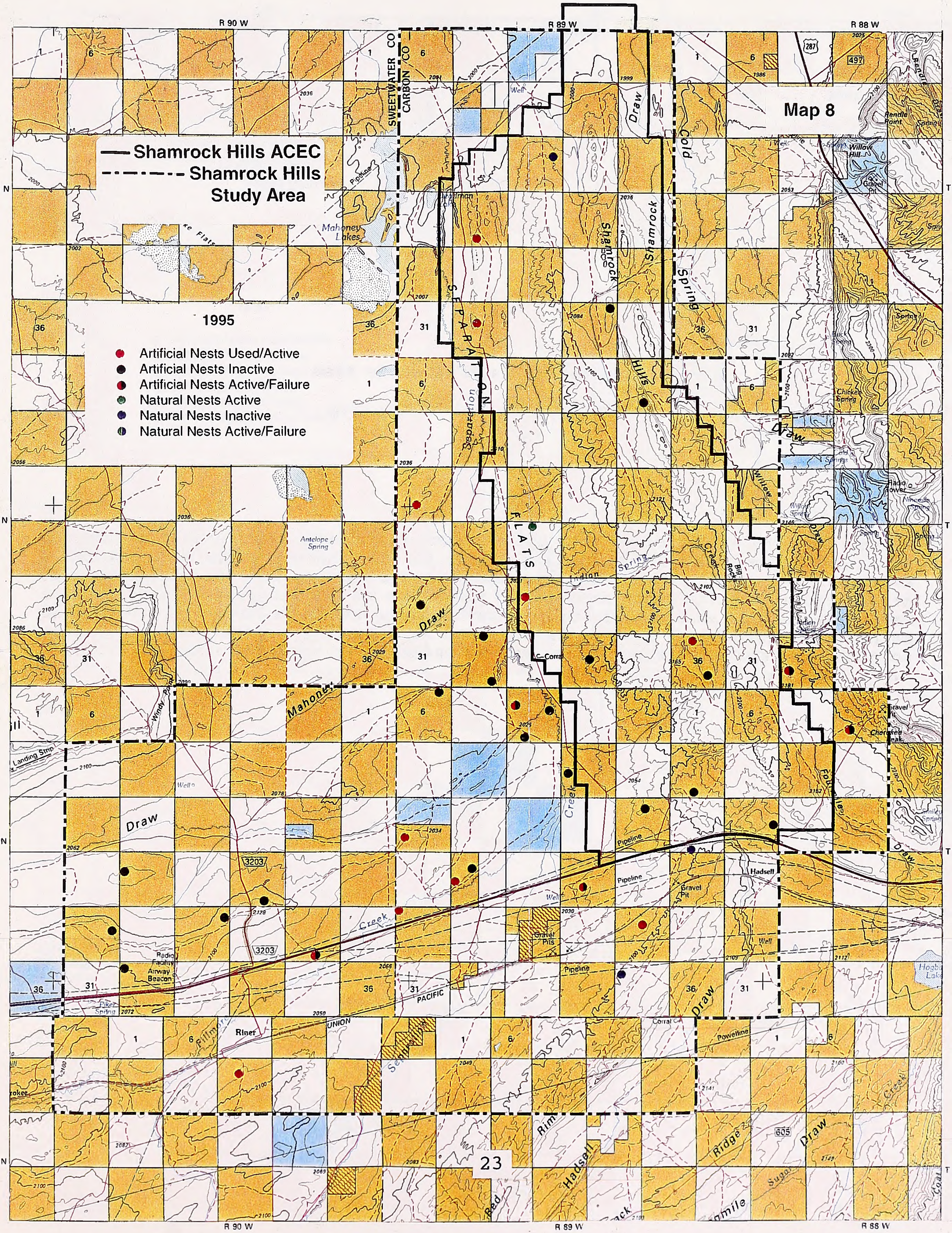
Shamrock Hills ACEC Study Area

Ferruginous Hawk Monitoring

1995

As in 1994, the entire Shamrock Hills ACEC Study Area was surveyed. No ANSs were removed or added so at the beginning of the 1995 nesting season there were 36 ANSs available. Fifteen ANSs were active, but only 10 were successful at producing young. Only 17 young were raised from the 10 successful nests, a particularly low level of production. Of the five unsuccessful nests, two failed with 2 and 3 eggs in them respectively, and the other 3 were empty when abandoned. One natural nest was active and 2 young were raised. In all, only 11 nesting pairs of ferruginous hawks were successful in producing 19 young in 1995.

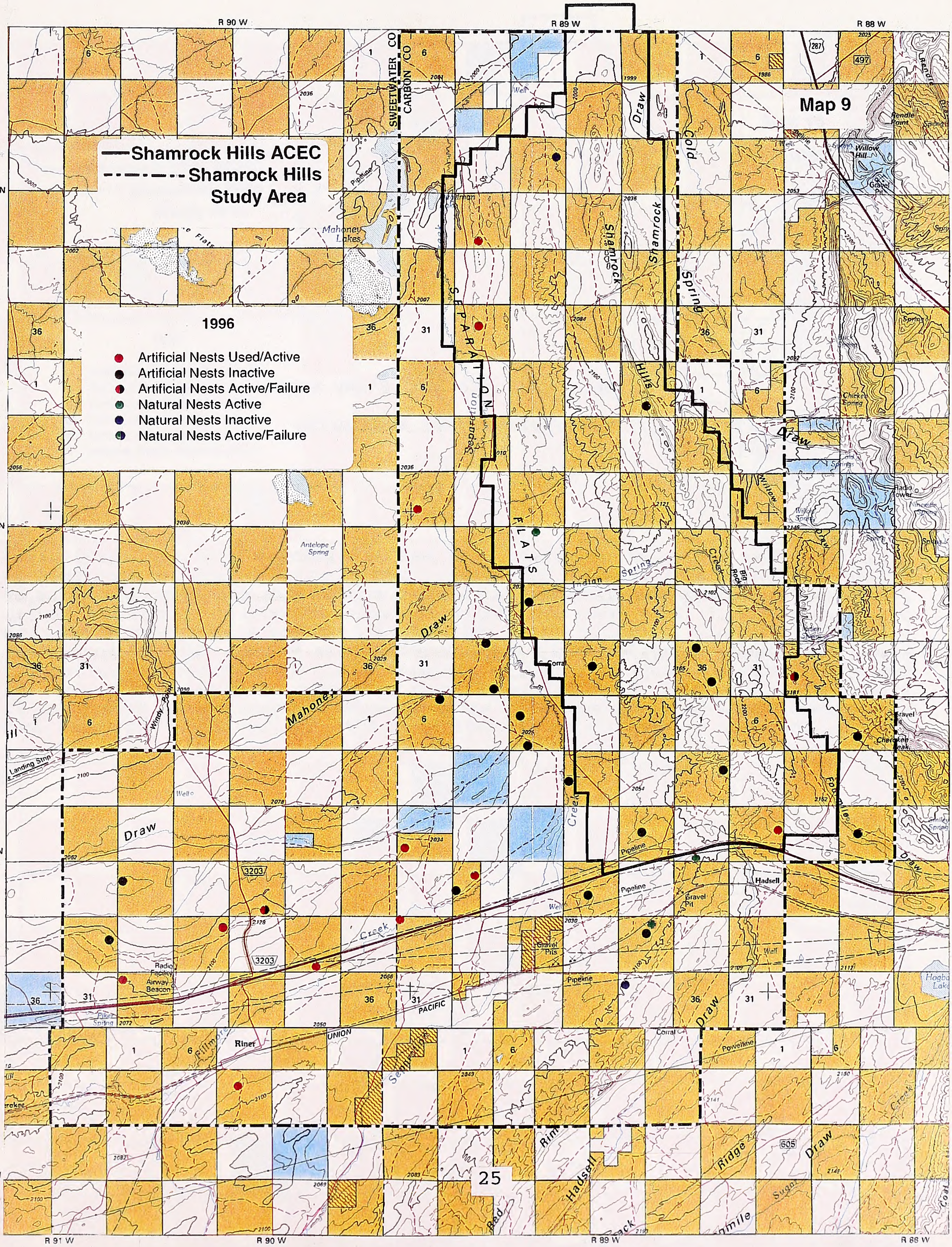

Map 8
Shamrock Hills ACEC
Shamrock Hills Study Area
1995
● Artificial Nests Used/Active
● Artificial Nests Inactive
● Artificial Nests Active/Failure
● Natural Nests Active
● Natural Nests Inactive
● Natural Nests Active/Failure
R 90 W
R 89 W
R 88 W
T 23 N
T 22 N
T 21 N
T 20 N
SWEETWATER CO
CARBON CO
Mahoney Lakes
Separation Flats
Separation Draw
Shamrock Hills
Shamrock Draw
Cold Spring Draw
Willow Draw
Spring Creek
Indian Spring
Big Rocks
Antelope Spring
Chicken Spring
Cherokee Peak
Willow Hill
Rendle Point
Mahoney Draw
Windy Point
Hadsell
Riner
Radio Facility Airway Beacon
Piper Spring
Landing Strip
Corral
Gravel Pit
Gravel Pits
Pipeline
Powerline
Well
Radio Tower
Hogback Lake
Separation Creek
Fillmore
Union Pacific
Hadsell Rim
Red Rim
Ridge
Sugar Creek Draw
Eightmile
287
497
3203
605

Shamrock Hills ACEC Study Area

Ferruginous Hawk Monitoring

1996

Again, two ANSs were removed from the Shamrock Hills ACEC Study Area bringing the total available for the 1996 nesting season to 34. Thirteen ANSs were initially used by nesting pairs of ferruginous hawks, and 2 were abandoned. The remaining 11 successful nesting pairs produced 27 nestlings to fledging age. Three natural nests were active and the adults produced 7 young at these nests. In total, 14 successful ferruginous hawk pairs produced 34 nestlings in the ACEC study area in 1996. To our knowledge, there was no observed or reported nest mortality.

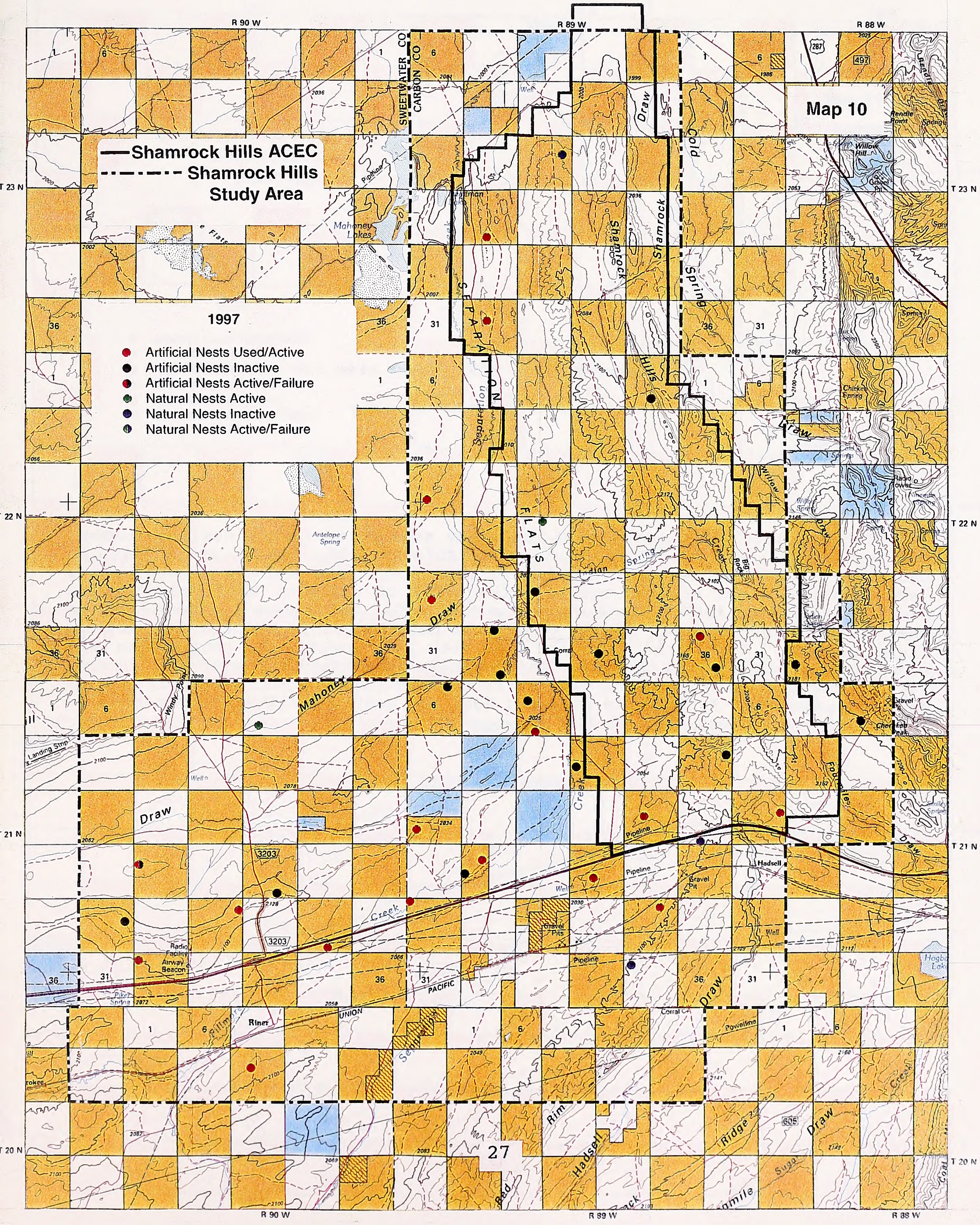

Map 9
Shamrock Hills ACEC
Shamrock Hills Study Area
1996
● Artificial Nests Used/Active
● Artificial Nests Inactive
● Artificial Nests Active/Failure
● Natural Nests Active
● Natural Nests Inactive
● Natural Nests Active/Failure
R 91 W
R 90 W
R 89 W
R 88 W
T 23 N
T 22 N
T 21 N
T 20 N
SWEETWATER CO
CARBON CO
Separation Flats
Separation Draw
Shamrock Hills
Shamrock Draw
Cold Spring Draw
Willow Creek
Mahoney Lakes
Mahoney Draw
Antelope Spring
Chicken Spring
Willow Hill
Rendle Point
Radio Tower
Cherokee Peak
Hadsell
Gravel Pit
Gravel Pits
Riner
Radio Facility
Airway Beacon
Piper Spring
Landing Strip
Windy Point
Corral
Pipeline
Well
UNION PACIFIC
Hadsell Rim
Red Rim
Ridge Draw
Sugar Creek
Fourmile Draw
Big Rock
Hogback Lake
287
497
3203
605

Shamrock Hills ACEC Study Area

Ferruginous Hawk Monitoring

1997

Prior to the 1997 nesting season, one ANS was removed from the study area, leaving 33 ANSs available for this year. Beginning this year, we were able to hire two volunteers who spent approximately 3 months each surveying all nests in the study area. This year was one of the more productive in several years. Eighteen ANSs were initially active and 2 failed. Of the sixteen active ANS, one was occupied by a golden eagle which produced one young. The 15 successful nesting pairs produced 32 young to fledging age. In addition, there were 2 active and successful natural nests each producing 3 young. In total, 18 successful nesting ferruginous hawk pairs produced 38 young in the study area in 1997. There was no observed nest mortality in 1997, but one adult was found dead about a mile from an active ANS.



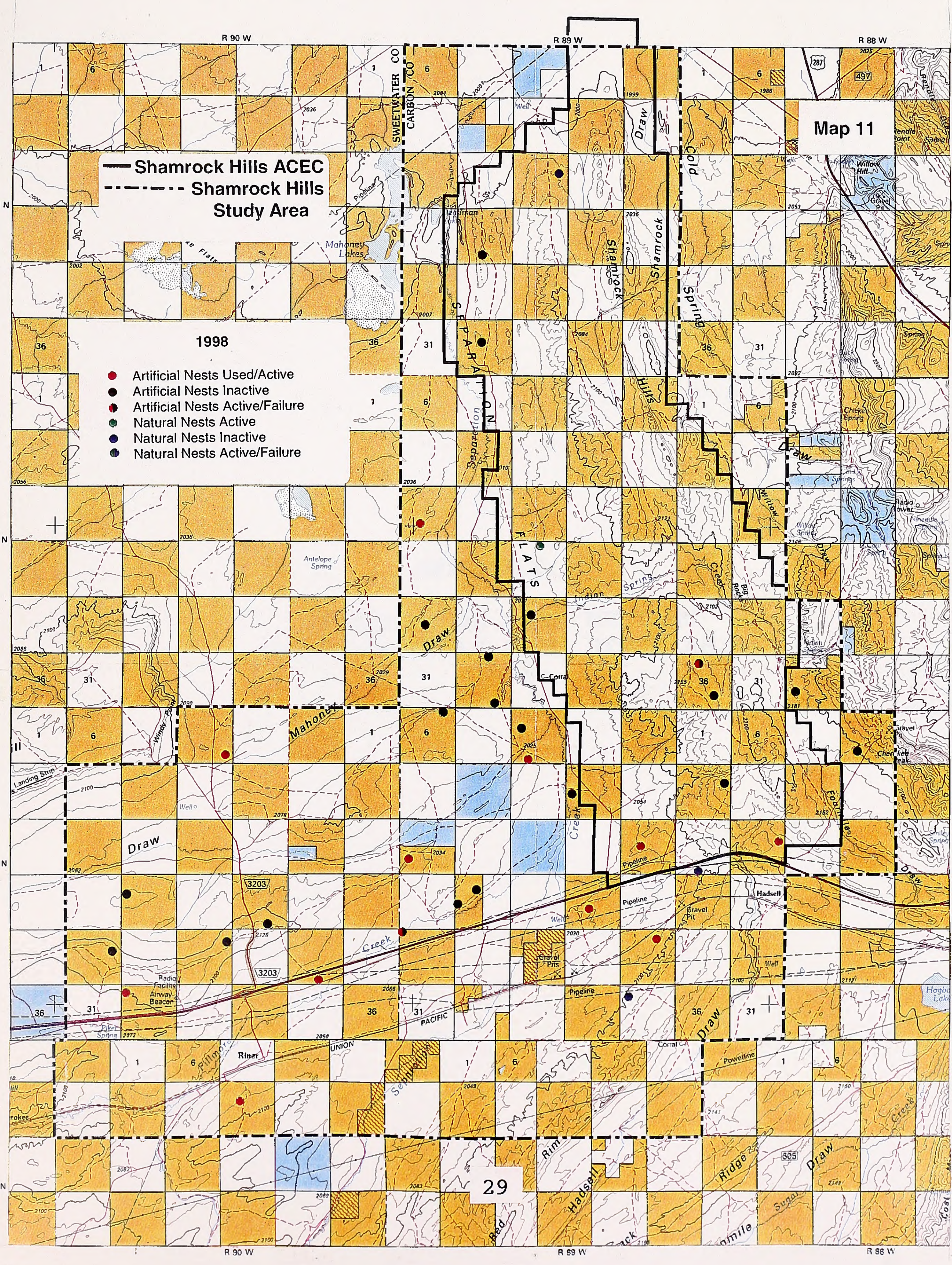
Map 10
Shamrock Hills ACEC
Shamrock Hills Study Area
1997
Artificial Nests Used/Active
Artificial Nests Inactive
Artificial Nests Active/Failure
Natural Nests Active
Natural Nests Inactive
Natural Nests Active/Failure
R 90 W
R 89 W
R 88 W
T 23 N
T 22 N
T 21 N
T 20 N
SWEETWATER CO
CARBON CO
Mahoney Lakes
Separation Flats
Shamrock Hills
Shamrock Draw
Cold Spring
Antelope Spring
Separation Draw
Mahoney
Windy Point
Draw
Creek
Pipeline
Hadsell
Gravel Pit
Gravel Pits
Riner
Union Pacific
Radio Facility Airway Beacon
Fillmore
Hadsell Rim
Ridge
Draw
Red
Cherokee Peak
Willow Hill
Chicken Spring
Radio Tower
Rendle Point
Landing Strip
Corral
Well
Hogback Lake
Piper Spring
3203
287
497
605

Shamrock Hills ACEC Study Area

Ferruginous Hawk Monitoring

1998

No ANSs were added or removed from the study area prior to the nesting season, so there were 33 artificial structures available in 1988. Again, as in 1997, we had 2 volunteers who surveyed the entire area. All ANSs and all natural nests were surveyed. For unknown reasons, the level of activity this year dropped significantly from 1997. There were 13 active ANSs, but 2 were abandoned before the adults produced eggs. The 11 successful nesting pairs produced 31 young to fledging age. While the level of activity was lower, the production was considerably higher than in 1997. There was 1 active natural nest, and 2 young were produced. In all, there were 12 successful nesting pairs of ferruginous hawks who produced 33 young to fledging age. No nest mortality was observed or reported in the study area in 1998


Map 11
Shamrock Hills ACEC
Shamrock Hills Study Area
1998
● Artificial Nests Used/Active
● Artificial Nests Inactive
● Artificial Nests Active/Failure
● Natural Nests Active
● Natural Nests Inactive
● Natural Nests Active/Failure
R 90 W
R 89 W
R 88 W
T 23 N
T 22 N
T 21 N
T 20 N
SWEETWATER CO
CARBON CO
Mahoney Lakes
Separation Flats
Separation Draw
Shamrock Draw
Shamrock Hills
Cold Spring
Indian Spring Creek
Big Rocks
Willow Draw
Chicken Spring
Cherokee Peak
Mahoney Draw
Windy Point
Antelope Spring
Hadsell
Riner
Pillmore
Pipeline
Creek
Gravel Pits
Radio Facility Airway Beacon
Union Pacific
Powelline
Red Rim
Hadsell Ridge
Sugar Creek Draw
Hogback Lake
Willow Hill
Radio Tower
287
497
3203
605

APPENDIX 1B

FERRUGINOUS HAWK NESTING
SHAMROCK HILLS ACEC STUDY AREA
1998

Legend for Appendix 1B

Raptor nests shown in black ink are old, known nests monitored or reinventoried during this years efforts.

Raptor nests shown in green ink are newly discovered nests which are being added to the inventory as a result of this year's inventory/ monitoring efforts.

Raptor nests shown in red ink are old nests which have deteriorated to an extent that they are no longer identifiable nests. These nests are recommended for removal from the inventory.

Note: All raptor nest numbers have 5 distinct parts to them. All nest numbers contain 10 digits; the first two designate the species; the second two indicate the township; the third pair of numbers represent the range; the fourth pair is the section; and the last two digits represent a sequential number of nests of that species found in that section. Therefore, FH21892006 is a ferruginous hawk nest in township 21 north, range 89 west, section 20, and this particular nest is the sixth ferruginous hawk nest inventoried from that section.

Also, all lists of raptor nests are sorted on the "Range" number. All range 21 nests, for instance, are listed before range 22 nests. Within range 21, all township numbers are arranged sequentially, so that FH16892003 will appear before FH17892003. Within the same township and range, the nests are arranged sequentially by section.

This arrangement is consistent throughout this report.

APPENDIX 1B

Raptor Nest Monitoring -- Shamrock Hills Study Area - 1998
Mike Schulze, Scott Lilley

Nest Number	Date	Status	Condition/Comments
Range 88			
AFH21880401	05-15-98	Inactive	fair
FH21880801	04-29-98	Inactive	Fair
FH21880802	04-29-98	Inactive	Fair
FH21880803	04-29-98	?	Did not find (RFI)
FH21880804	04-29-98	Inactive	Poor
FH21880805	04-29-98	Inactive	Fair; beginning to fall
FH21880806	04-29-98	Inactive	Fair; beginning to fall
FH21880807	04-29-98	?	Did not find (RFI)
FH21881701	04-29-98	Inactive	Fair
FH21881801	04-15-98	Inactive	Good
FH21881802	04-15-98	Inactive	Fair. flat, no cup
FH21881803	04-15-98	Inactive	Poor. no structure
FH21881804	04-15-98	Inactive	Fair/poor
FH21881805	04-15-98	Inactive	Good
FH21881806	04-15-98	Inactive	Good
FH21881807	04-15-98	Inactive	Poor. very small
AFH21881809	04-29-98	Active	Excellent; 4 young banded/fledged
FH22883001	05-27-98	Inactive	Poor (new nest)
GE22883001	05-27-98	Inactive	Fair (new nest)
GE22883002	05-27-98	Inactive	Fair (new nest)
AFH22883201	04-29-98	Inactive	Fair/good
Range 89			
FH20890301	05-11-98	Inactive	Fair; good size nest
RT20890301	05-11-98	Inactive	Good; no cup
FH20890401	05-11-98		Remove from inventory
FH20890402	05-11-98	Inactive	Good. very nice nest, small
PF21890101	04-29-98	?	Did not find
FH21890102	04-20-98	Inactive	Poor
FH21890103	04-29-98	Inactive	Good; large nest
FH21890106	04-29-98	Inactive	Good; flat, no cup
FH21890107	04-29-98	Inactive	Good
FH21890108	04-29-98	Inactive	Good; large nest
FH21890109	04-29-98	Inactive	Good; small nest
FH21890201	04-20-98	Inactive	Fair; some whitewash
FH21890204	05-04-98		Remove from inventory
FH21890205	05-04-98	Inactive	Poor; bushy-tailed rat
FH21890206	05-04-98	Inactive	Good; flat, no cup
FH21890207	04-20-98	Inactive	Fair; no cup, few sticks
FH21890208	04-16-98	Inactive	Poor; mostly fallen
FH21890209	05-04-98	Inactive	Poor
FH21890210	04-20-98	Inactive	Good; flat, no cup
FH21890211	04-30-98	Inactive	Poor
FH21890212	05-05-98		Remove from inventory
FH21890213	04-20-98	Inactive	Good; very large, no cup
AFH21890401	04-28-98	Active	Good; 2 young banded/fledged
AFH21890402	04-28-98	Inactive	Good
FH21890601	04-30-98	Inactive	Poor
FH21890602	04-30-98		Did not find
AFH21890603\ AGE21890601	04-30-98	Inactive	Good
FH21890701	04-30-98	Inactive	Remove from inventory
FH21890801	04-30-98	Inactive	Remove from inventory
AFH21891001	04-16-98	Inactive	Good
FH21891101	04-28-98	Inactive	Good

Nest Number	Date	Status	Condition/Comments
Range 89 (Cont)			
FH21891102	04-16-98	Inactive	Good; shallow, no cup
FH21891103	04-20-98	Inactive	Poor; has rocks in nest
FH21891104	04-20-98	Inactive	Poor; very few sticks
FH21891105	04-20-98	Inactive	Good; no cup
FH21891106	04-20-98	Inactive	Poor; very few sticks
FH21891107	04-20-98	Inactive	Excellent. basket covered
FH21891108	04-20-98	?	Did not find
FH21891109	04-16-98	Inactive	Covered with basket
FH21891203	04-20-98	Inactive	Fair; partially blown off
FH21891206	04-20-98	Inactive	Fair; some whitewash
AFH21891208	04-28-98	Inactive	Good
GE21891201	04-28-98	Inactive	Fair; part fallen
GE21891202	04-20-98	Inactive	Excellent. Huge nest
FH21891302	04-15-98	Inactive	Excellent
FH21891406	04-28-98	Inactive	Fair
AFH21891408	04-28-98	Active	Good; 2 young banded/fledged
FH21891701	04-28-98	?	Remove from inventory
AFH21891801	04-23-98	Active	Good; 3 young banded/fledged
BO21891901	06-08-98	Active	2 adults in area
AFH21892001	04-28-98	Inactive	Good
AFH21892002	04-28-98	Inactive	Good
AFH21892202	04-28-98	Active	Good; 2 young banded/fledged
FH21892401	04-21-98	Inactive	Fair. no cup, falling apart
FH21892601A	05-11-98	?	Did not find
FH21892601	05-11-98	?	Did not find
FH21892602	04-21-98	Inactive	Excellent. well built
AFH21892604	04-21-98	Inactive	Good
"	06-26-98	Active	Good; 2 young banded/fledged
AFH21893001	04-27-98	Active	Good
"	05-19-98	Inactive	Good; nest abandoned
FH21893301	05-11-98	Inactive	Poor. taken over by rat
FH21893401	04-21-98	Inactive	Fair. good amount of sticks
FH21893403	05-11-98		Remove from inventory
UB21893404	05-11-98	Inactive	Good. large nest
FH21893405	04-21-98	Inactive	Fair. small, low to ground
FH21893406	04-21-98	Inactive	Fair. small, some cup
FH21893502	05-11-98	Inactive	Poor
FH21893503	04-21-98	Inactive	Excellent. well built
FH21893504	04-21-98	Inactive	Poor. flat
FH21893601	05-11-98	Inactive	Good (new nest)
KE21893601	05-11-98	Active	Pair at nest
UB22890201	05-14-98	?	Did not find
FH22890201	05-14-98		Remove from inventory
FH22890301	05-13-98	Inactive	Excellent
FH22890302	05-13-98	Inactive	Fair
FH22890401	04-27-98	Inactive	Poor
FH22890402	04-27-98	Inactive	Poor; remove from inventory
FH22890403	04-27-98		Remove from inventory
FH22890404	04-27-98	Inactive	Fair
FH22890405	05-13-98		Remove from inventory
FH22890406	05-13-98	Inactive	Good; a little flat
GE22890401	04-27-98	Inactive	Poor; remove from inventory
FH22890501	04-27-98	Inactive	Good; flat, no cup
FH22890502	04-27-98	Inactive	Poor; remove from inventory
GE22890901	04-27-98	Inactive	Fair; boatloads of whitewash
FH22891001	05-21-98	Inactive	Poor; remove from inventory
FH22891002	05-19-98	Inactive	Excellent; very large nest
FH22891003	05-19-98	Inactive	Poor
FH22891004	05-19-98	Inactive	Poor
FH22891005	05-19-98	Inactive	Poor; remove from inventory
FH22891006	05-19-98	?	Did not find

Nest Number	Date	Status	Condition/Comments
Range 89 (Cont)			
FH22891008	05-21-98	Inactive	Good
FH22891009	05-21-98	Inactive	Fair
FH22891010	05-21-98	Inactive	Poor
FH22891011	05-21-98	Inactive	Poor; remove from inventory
FH22891012	05-21-98	Inactive	Fair
FH22891013	05-21-98	Inactive	Remove from inventory
FH22891014	05-21-98		Remove from inventory
FH22891015	05-19-98	Inactive	Good (new nest)
FH22891016	05-21-98	Inactive	Fair (new nest)
FH22891101	05-14-98	?	Did not find
FH22891102	05-14-98	?	Did not find
FH22891201	05-14-98		Remove from inventory
FH22891202	05-14-98	Inactive	Excellent; very large nest
FH22891203	05-14-98	Inactive	Good
FH22891204	05-14-98		Remove from inventory
FH22891205	05-14-98	Inactive	Good
FH22891301	05-14-98	Inactive	Good
FH22891302	05-14-98	Inactive	Fair
FH22891303	05-14-98	Inactive	Good. large nest
FH22891304	05-27-98	Inactive	Excellent
FH22891305	05-27-98		Poor; remove from inventory
FH22891306	05-27-98	Inactive	Excellent
NH22891301	05-27-98		No longer exists. remove
FH22891401	05-19-98	Inactive	Poor; remove from inventory
FH22891402	05-05-98	Inactive	Fair; flat nest
FH22891403	05-19-98	?	Did not find
FH22891501	05-19-98	Inactive	Remove from inventory
FH22891502	05-05-98	Inactive	Fair
GE22891501	05-05-98	Inactive	Poor; remove from inventory
PF22891501	05-05-98	Inactive	
PF22891502	05-05-98	?	Did not find
FH22891604	04-30-98	?	Did not check; close to active nest; presumed inactive
FH22891605	04-30-98	?	Did not check; close to active nest; presumed inactive
FH22891606	04-30-98	Active	Golden Eagle in nest
AFH22891801	05-19-98	Active	Good; 3 young banded/fledged
FH22892101	04-30-98	?	Did not check; close to active nest; presumed inactive
FH22892102	04-30-98	?	Did not check; close to active nest; presumed inactive
FH22892103	04-30-98	Active	Pair in and around nest; 2 young banded/fledged
FH22892104	04-30-98	Inactive	Poor; most of nest fallen
FH22892105	04-30-98	Inactive	Poor
FH22892205	05-19-98	Inactive	Good
FH22892207	04-30-98	?	Did not find
FH22892209	05-19-98	Inactive	Poor
FH22892210	05-19-98	Inactive	Excellent
GE22892201	05-19-98	Inactive	Poor
GE22892202	05-19-98	Inactive	Good
KE22892201	05-19-98	?	Did not find
KE22892202	05-19-98	?	Did not find
PF22892201	05-19-98	Active	New nest
FH22892301	05-04-98	Inactive	Poor
FH22892302	05-04-98	Inactive	Poor; large nest, but fallen
FH22892401	05-14-98	Inactive	Good; flat on top
FH22892402	05-14-98	Inactive	excellent. good cup
FH22892501	04-29-98	Inactive	Good; small nest, good cup
KE22892601	05-04-98	Active	Pair in nest
FH22892602	05-04-98	Inactive	Fair; a lot of sticks

Nest Number	Date	Status	Condition/Comments
Range 89 (Cont)			
FH22892603	05-04-98	Inactive	Poor; remove from inventory
FH22892604	05-04-98	Inactive	Poor
FH22892605	05-04-98	Inactive	Poor; remove from inventory
FH22892606	05-04-98	Inactive	Fair
FH22892702	04-30-98	Inactive	Poor; remove from inventory
FH22892703	04-30-98	Inactive	Fair; flat nest
FH22892707	04-30-98	Inactive	Poor
AFH22892801	04-30-98	Active	Adults at nest
"	06-12-98	Inactive	Nest abandoned; no eggs; no adults
FH22892901	04-30-98		Eroded, remove from inventory
AFH22893001	04-30-98	Inactive	Good
AFH22893201	04-28-98	Inactive	Good
AFH22893203	04-30-98	Inactive	Good
FH22893401	05-04-98	Inactive	Fair
FH22893402	05-18-98	Inactive	Poor
FH22893405	05-19-98	Inactive	Fair; part fallen
FH22893407	05-18-98	Inactive	Fair
FH22893408	05-18-98	Inactive	Fair
FH22893409	05-18-98	Inactive	Poor
FH22893410	05-19-98	Inactive	Excellent
FH22893411	05-19-98	Inactive	Fair
AFH22893412	05-19-98	Inactive	Good
FH22893501	05-19-98	Active	Pair of GE; 1 chick present
FH22893502	05-19-98	?	Did not check; close to active nest; presumed inactive
FH22893503	05-04-98	?	Did not find
FH22893504	04-29-98	Inactive	Poor; remove from inventory
GE22893501	05-19-98	?	Did not check; close to active nest; presumed inactive
GE22893502	05-19-98	?	Did not check; close to active nest; presumed inactive
GE22893503	05-04-98	Inactive	Poor; mostly fallen
FH22893601	04-29-98	Inactive	Fair
FH22893602	04-29-98	Inactive	Excellent
AFH22893603	04-29-98	Active	Bird on nest
"	06-12-98	Inactive	Nest abandoned
AFH22893605	04-16-98	Inactive	good
FH23890302	05-08-98	Inactive	Poor; remove from inventory
FH23890303	05-08-98	Inactive	Good
FH23891001	05-08-98	Inactive	Poor; remove from inventory
FH23891002	05-08-98	Inactive	Poor
FH23891003	05-08-98	Inactive	Poor
FH23891004	05-08-98	Inactive	Poor
FH23891005	05-08-98	Inactive	Poor
FH23891006	05-08-98	Inactive	Fair
FH23891101	05-08-98	Inactive	Poor
FH23891401	05-08-98		Remove from inventory
FH23891501	05-08-98	Inactive	Poor; mostly fallen apart
FH23891502	05-08-98	Inactive	Poor; not much left
FH23891601	05-13-98	Inactive	Good
FH23891603	05-13-98	Inactive	Excellent. small, nice cup
FH23891604	05-13-98	Inactive	Good; really big, no cup
FH23891605	05-13-98	Inactive	Poor; not much structure
FH23891701	04-27-98	Inactive	Excellent, some pellets
FH23891702	04-27-98	Inactive	Poor; not recently attended
FH23892001	04-27-98	?	Did not find
FH23892003	04-27-98	Inactive	Poor; remove from inventory
FH23892004	04-27-98	Inactive	Poor; remove from inventory
FH23892005	04-27-98	Inactive	Poor; very few sticks
FH23892006	04-27-98	?	Did not find
AFH23892008	04-27-98	Inactive	Good

Nest Number	Date	Status	Condition/Comments
Range 89 (Cont)			
FH23892101	05-13-98	Inactive	Good; flat on top
FH23892102	05-13-98	Inactive	Good/fair; small, nice shape
FH23892103	05-13-98	Inactive	Good size; some fallen
FH23892601	05-08-98	Inactive	Good
FH23892602	05-08-98	Inactive	Fair
FH23892603	05-08-98	Inactive	Poor
FH23892604	05-08-98	Inactive	Fair
FH23892605	05-08-98	Inactive	Fair
FH23892701	05-08-98	Inactive	Poor
FH23892702	05-08-98	Inactive	Fair
FH23892801	05-13-98	Inactive	Poor
FH23892802	05-13-98	?	Did not find
FH23892803	05-13-98	Inactive	Good
FH23892804	05-13-98	?	Did not find
FH23892901	04-27-98	Inactive	Fair
FH23892902	04-27-98	Inactive	Poor; flat, no structure
FH23892903	04-27-98	Inactive	Poor; remove from inventory
FH23893201	04-27-98	Inactive	Poor; remove from inventory
FH23893202	04-27-98	Inactive	Poor; remove from inventory
FH23893203	04-27-98	Inactive	Good; nice nest
FH23893204	04-27-98	Inactive	Good
FH23893205	04-27-98	Inactive	Poor
AFH23893206	04-27-98	Inactive	good
FH23893301	05-13-98	Inactive	Fair; most sticks fallen
FH23893302	04-27-98	Inactive	Poor;but plenty of sticks
FH23893303	04-27-98	Inactive	Fair; a lot of whitewash
FH23893304	04-27-98	Inactive	Poor; flat, few sticks
FH23893305	05-13-98	Inactive	Fair
FH23893306	05-13-98	Inactive	Fair; small, decent shape
FH23893501	05-27-98	Inactive	Fair
FH23893502	05-27-98	Inactive	Good
FH23893503	05-27-98	Inactive	Fair
FH23893504	05-27-98	Inactive	Poor (new nest)
FH23893505	05-27-98	Inactive	Fair (new nest)
FH23893506	05-27-98	Inactive	Good (new nest)
FH23893507	05-27-98	Inactive	Fair (New nest)
GE23893501	05-15-98	Inactive	Good
Range 90			
FH21900101	04-30-98		Remove from inventory
FH20900702	04-24-98	Inactive	Good; large nest, no cup
FH20900703	04-24-98	Inactive	Poor
FH20900704	04-24-98	Inactive	Fair
FH20900705	04-24-98	?	Did not find
FH20900707	04-24-98	Inactive	Good; flat, no cup
FH20900708	04-24-98	Inactive	Good; small nest
FH20900802	04-24-98	?	Did not check; close to active nest; presumed inactive
FH20900803	04-24-98	?	Did not check; close to active nest; presumed inactive
AFH20900805	04-24-98	Active	Good; 2 young banded/fledged
AFH21900401	05-19-98	Active	Good; 3 young banded/fledged
FH21901201	04-23-98	Inactive	Good; well built
SH21901401	04-23-98	Inactive	Fair
AFH21902001	04-23-98	Inactive	Good
AFH21902202	04-23-98	Inactive	Good
FH21902302	04-23-98	Inactive	Poor
FH21902401	04-23-98	Inactive	Poor; flat, little structure
FH21902402	04-23-98	Inactive	Poor; remove from inventory
AFH21902601	04-16-98	Active	Excellent; 4 young fledged
FH21902701	04-23-98	Inactive	Poor; remove from inventory

Nest Number	Date	Status	Condition/Comments
Range 90 (Cont)			
AFH21902802	04-23-98	Inactive	Good
FH21902803	04-23-98	Inactive	Excellent; well built
FH21902902	04-23-98		Remove from inventory
AFH21903002/ AGE21903001	04-23-98	Inactive	Good
FH21903003	04-23-98	Inactive	Fair; small nest, no cup
FH21903201	04-23-98	Inactive	Excellent
AFH21903203	05-19-98	Active	Excellent; 3 young banded/fledged
FH21903301	04-23-98	Inactive	Poor; remove from inventory
Range 91			
FH20911101	04-24-98	Inactive	Good; nice cup
FH20911102	05-18-98	?	Did not find; remove?
FH20911103	04-24-98	Inactive	Good; small nest, well built (new Nest)
FH20911201	04-24-98	Inactive	Fair
FH20911202	04-24-98	Inactive	
FH20911203	05-18-98	?	Did not find; remove?
FH20911204	05-18-98	Inactive	Poor
FH21911201	04-24-98	Inactive	Good
FH21911202	04-24-98	Inactive	Poor

PART 2

Raptor Inventory/Monitoring in the Great Divide Resource Area, 1998 With Emphasis on the Continental Divide/Wamsutter II Oil and Gas EIS Area

Since the early 1980s, there has not been an intensive raptor inventory within the Great Divide Resource Area except for limited area surveys prompted by special projects or EIS efforts. Other updates and additions to the inventory have been scattered and haphazard. In 1997 John Hart, a volunteer recruited through the American Birding Association's volunteer directory, completed a partial inventory of the very northeastern portion of the Continental Divide/Wamsutter II EIS area. In 1998 we were able to recruit 4 volunteers to do an intensive inventory of this area. The CD/WII area is generally located in Townships 15 through 23 North, Ranges 91 through 99 West in Carbon and Sweetwater counties and encompasses approximately 1,061,200 acres of federal (531,400), state (9,800), and private (520,000) surface. The CD/WII area is located approximately 25 miles west of Rawlins and 40 miles east of Rock Springs, with I-80 bisecting the area (Maps 2 and 3).

This EIS, along with others for adjacent areas, specify that impacts to wildlife from the development activities will be monitored. This report represents our efforts to inventory and monitor the local raptor population with emphasis on ferruginous hawks and golden eagles within the CD/WII EIS area. This part of the overall report is broken down into three analysis areas: 1) data collected north of I-80, 2) monitoring south of I-80, and 3) monitoring/inventory data from outside the CD/WII EIS area. A summary of all the raptor monitoring data will be presented at the end of this part.

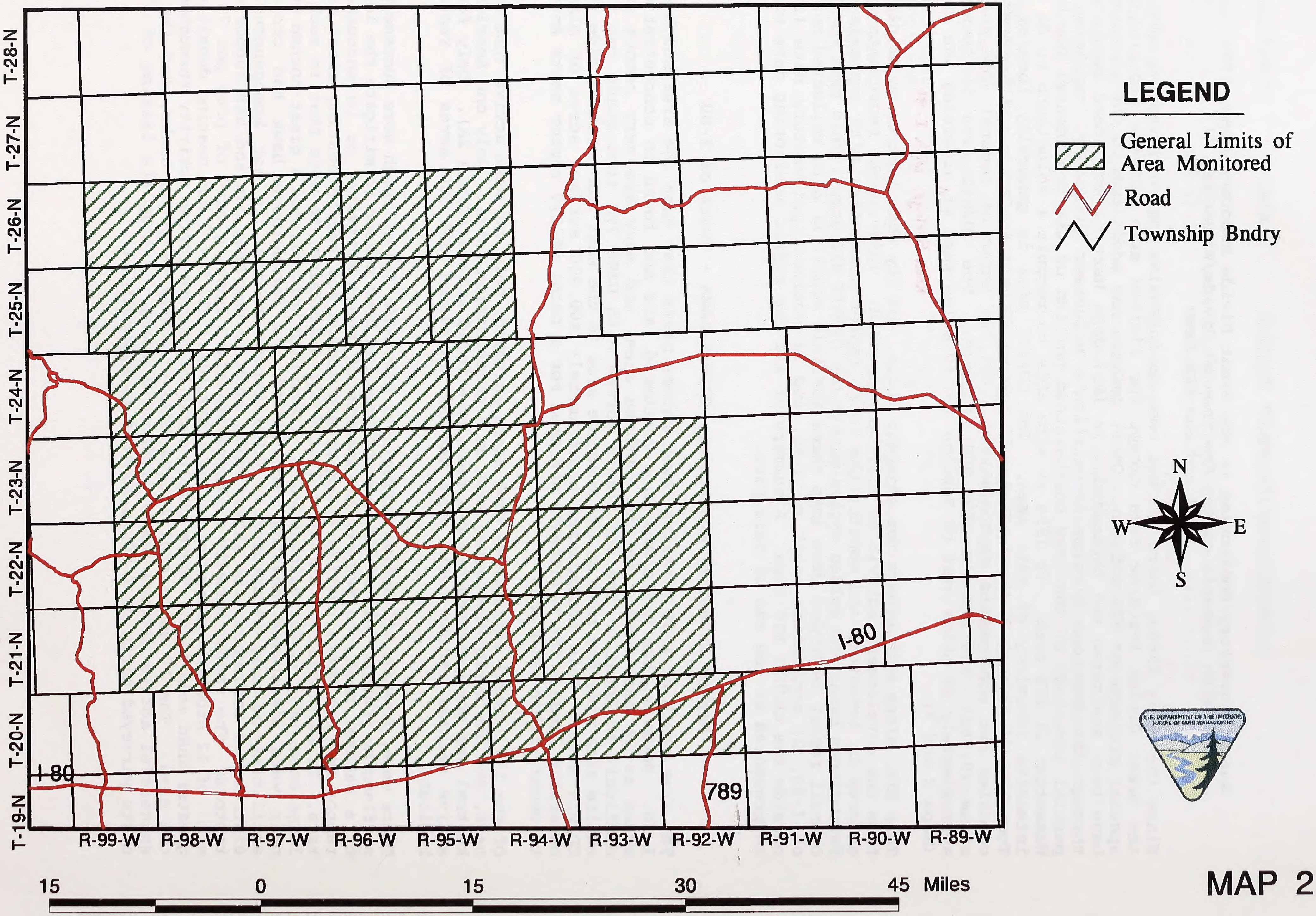
Raptor Inventory/Monitoring, CD/WII AREA - North of I-80

The area north of I-80 contains fewer raptor nests than does the area south of I-80. However, the nests are more scattered, are not found in concentration areas as is more common in the southern area, and many are very remote and difficult to locate. The volunteers worked with USGS 7½" topo quads for the entire area plus the rest of the resource area to the west and north outside the CD/WII area. This encompasses approximately 800,000 surface acres of mixed ownership lands. The volunteers searched for a total of 170 raptor nests known to occur within this area.

Of the 136 natural ferruginous hawk nests surveyed, only two were active (one old nest, and one newly-discovered nest on a condensation tank). Only one American kestrel and one great-horned owl nest were found active (Table 2A). Only four active natural raptor nests were located in almost 800,000 acres of raptor habitat.

There were, however, 12 active ferruginous hawk ANSs (10 of which were successful at fledging young). All of these structures had been placed to mitigate the loss of a natural nest, to reduce the impacts of human activity, or to encourage raptor nesting where nesting attempts are common but secure nesting sites are rare. It is startling, and not a little bit disturbing, to note that in such a large area, only 14 ferruginous hawks, 1 American kestrel, and 1 great-horned owl pair were discovered nesting, and 12 of the ferruginous hawk had chosen artificial nesting structures. While raptor habitat is not homogeneously distributed throughout the survey area, much of the area can and has supported raptors. The raptor density is approximately 1 nesting bird of prey per 78.1 mi^2. Of 12 studies referenced in the literature, all but 2 had nesting densities greater than seen here. There simply ought to be more raptor activity throughout the area. The 10 successful active ANSs produced 29 young hawks, and the 2 successful active natural nests produced 8 young. A complete listing of all nests surveyed north of I-80 is located in Appendix 2A.

RAPTOR NEST MONITORING NORTH OF I-80



MAP 2

TABLE 2A
SUMMARY OF RAPTOR NESTS MONITORED
IN THE CONTINENTAL DIVIDE/GREATER WAMSUTTER II EIS AREA
NORTH OF I-80
1998

Species	Total # of Known Nests Searched For	# of Known Nests Found; not Active	# of Known Nests No Longer There	# of Known Nests not Found	# of Known Nests Found Active	# of New Nests Found Active	# of New Nests Not Active	# of Active Nests Abandoned Or Failed
Ferruginous Hawk	136	103	5	16	1	1	10	0
Ferruginous Hawk ANS[1]	18	6	0	0	12	0	0	2
Golden Eagle	1	0	1	0	0	0	0	0
Golden Eagle ANS[2]	1	1	0	0	0	0	0	0
American Kestrel	3	0	1	1	1	0	0	0
Prairie Falcon	1	1	0	0	0	0	0	0
Burrowing Owl	5	3	1	1	0	0	0	0
Northern Harrier	2	0	0	2	0	0	0	0
Great Horned Owl	1	0	0	0	1	0	0	0
Unidentified Raptor	2	0	0	2	0	0	0	0
Totals	170	114	8	22	15	1	10	2

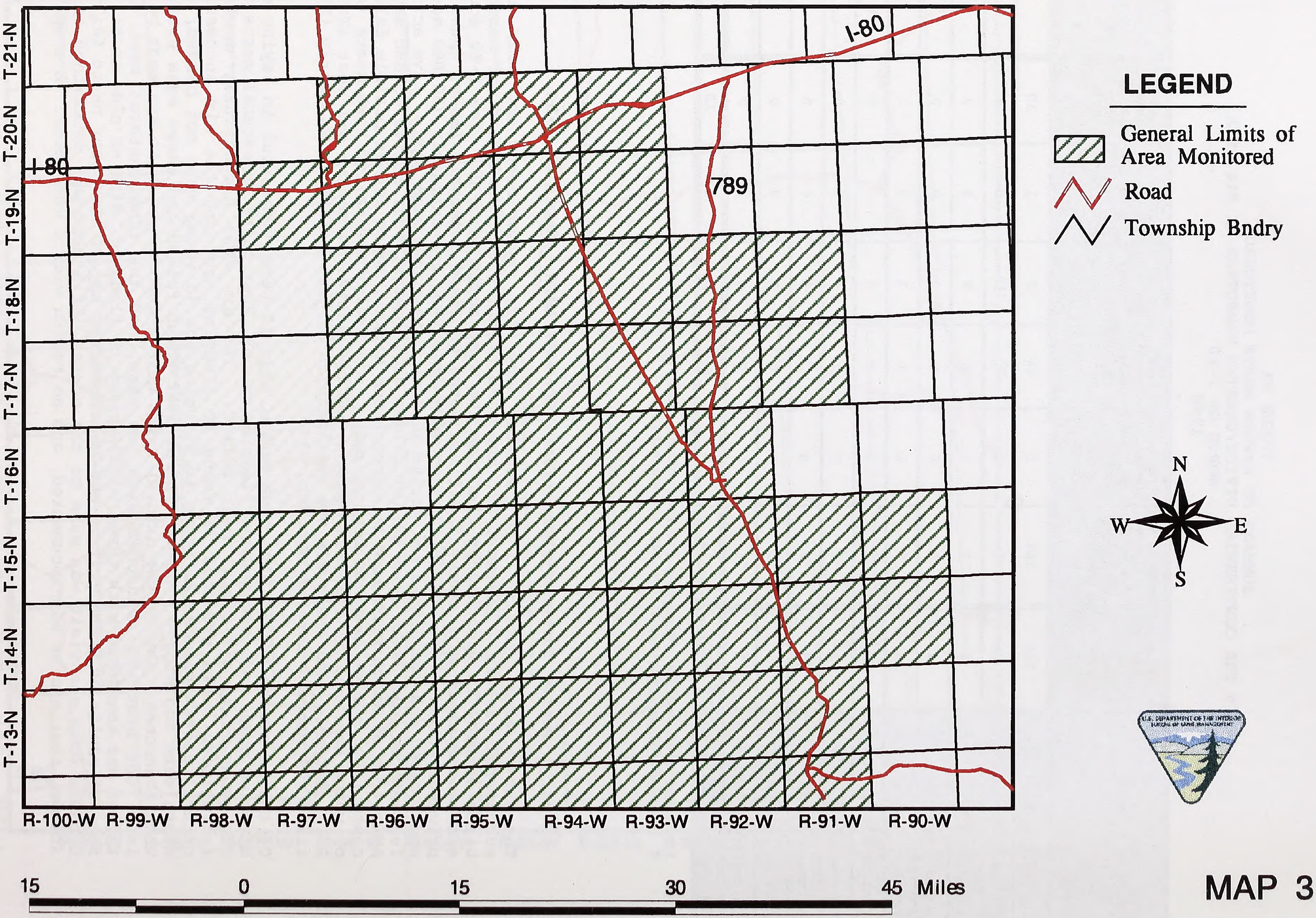
1 Artificial nesting structure for ferruginous hawks.
2 Artificial nesting structure for golden eagles.

Raptor Inventory/Monitoring, CD/GWII AREA - South of I-80

The survey area south of I-80 contains many more raptor nests and many more successful nesters. However, for the size of the area, the number of nesting birds of prey is much higher than for the area north of I-80. The I-80 south area encompasses well over 1.5 million acres of mixed ownership lands, (public, private, state). The volunteers were able to survey approximately 730,000 acres and located and documented ten active natural ferruginous hawk nests, five active ferruginous hawk ANSs, four active golden eagle nests, four active golden eagle ANSs (two of which were used by ferruginous hawks), seven active prairie falcon nests, four active American kestrel nests, six active red-tailed hawk nests (one of which was used by a golden eagle), and one active burrowing owl nest (Table 2B). For this area there was one nesting bird of prey per 27.8 mi^2, nearly three times the density for the northern area.

Of the 17 active ferruginous hawk pairs, only 12 were successful in laying and hatching eggs, and subsequently fledging young. Four pairs on natural nests and one pair on an artificial nest failed. The six ANSs successfully used by ferruginous hawks produced 23 young to fledging age, and the six successful natural nests produced 21 young to fledging age (8 young were not banded; the nests were too high). The artificial nest which failed had three eggs present when abandoned. Two of the natural nests were abandoned prior to any eggs being laid; one nest was abandoned with two eggs, and the final natural nest that failed was abandoned with three young, prior to fledging, with no clue as to the fate of adults or young. It is not known whether any of the other nests failed, because only one visit was made to the nests. If a nest was determined to be active, that status was documented, and no return visits were made. A complete

RAPTOR NEST MONITORING SOUTH OF I-80



MAP 3

list of all nests surveyed south of I-80 can be found in Appendix 2B.

As in the survey area north of I-80, it is somewhat disturbing to note that there are so few nesting birds of prey. In a surveyed area of approximately 730,000 acres, only 15 active ferruginous hawk nests were found. This relates to approximately 48,666 acres per active pair or one pair of ferruginous hawks per 76 square miles. This is a maximum figure and does not consider areas of human habitation, heavy disturbance, and areas unsuitable for ferruginous hawk nesting and foraging. Still, the low numbers of active nests is cause for concern.

The I-80 south area has experienced very significant and accelerated natural gas exploration and development activity over the last three to four years. In many areas there are currently four wells per square mile or plans for drilling at that density. It is probable that in some areas drilling densities will exceed four wells per mile square. At these densities, serious negative impacts to an already depressed nesting population of ferruginous hawks are likely.

TABLE 2B
SUMMARY OF RAPTOR NESTS MONITORED
IN THE CONTINENTAL DIVIDE/GREATER WAMSUTTER II EIS AREA
SOUTH OF I-80
1998

Species	Total # of Nests Searched For	# of Known Nests Found; not Active	# of Known Nests No Longer There	# of Known Nests not Found	# of Known Nests Found Active	# of New Nests Found Active	# of New Nests Not Active	# of Active Nests Abandoned Or Failed
Ferruginous Hawk	177	108	4	35	5	5	23	4
Ferruginous Hawk ANS[1]	8	3	0	0	5	0	0	1
Golden Eagle	55	35	1	10	3	1	5	0
Golden Eagle ANS[2]	7	3	0	0	4[3]	0	0	0
Prairie Falcon	15	0	0	8	4	3	0	0
American Kestrel	8	0	0	4	0	4	0	0
Red-Tailed Hawk	21	7	1	7	4[4]	2	0	0
Burrowing Owl	3	2	0	0	0	1	0	0
Great Horned Owl	4	0	0	4	0	0	0	0
Unidentified Raptor	4	0	0	1	0	0	3	0
Totals	302	158	6	69	25	16	28	5

1 Artificial nesting structure for ferruginous hawks.
2 Artificial nesting structure for golden eagles.
3 Two of these golden eagle ANSs were used by ferruginous hawks in 1998.
4 One of these natural red-tailed hawk nests was used by a golden eagle in 1998.

Raptor Inventory/Monitoring, the Rest of the Great Divide Resource Area

Some raptor nest monitoring was accomplished outside the intensive study areas in 1998. Most of this activity was done in conjunction with ANS monitoring, some extensive monitoring outside the Shamrock Hills ACEC, and in association with oil and gas development requests for exceptions to wildlife stipulation on leases. The results of this monitoring are in Table 2C. A total of 80 raptor nests were surveyed, including 32 natural ferruginous hawk nests and 22 ferruginous hawk ANSs.

TABLE 2C
SUMMARY OF RAPTOR NESTS MONITORED IN THE GREAT DIVIDE RESOURCE AREA
NESTS OBSERVED DURING OTHER MONITORING EFFORTS
1998

Species	Total # of Nests Searched For	# of Known Nests Found; not Active	# of Known Nests No Longer There	# of Known Nests not Found	# of Known Nests Found Active	# of New Nests Found Active	# of New Nests Not Active	# of Active Nests Abandoned Or Failed
Ferruginous Hawk	32	22	0	1	5[1]	2	2	1
Ferruginous Hawk ANS[2]	22	7	0	0	15[3]	0	0	2
Golden Eagle	13	5	0	1	5	2	0	0
Prairie Falcon	2	0	0	0	2	0	0	0
American Kestrel	1	0	0	0	1	0	0	0
Red-Tailed Hawk	5	0	0	3	1	1	0	0
Red-Tailed Hawk[4]	1	0	0	0	1	0	0	0
Great Horned Owl	1	1	0	0	0	0	0	0
Swainson's Hawk	2	0	0	1	1[5]	0	0	0
Unidentified Raptor	1	1	0	0	0	0	0	0
Totals	80	36	0	6	31	5	2	3

1 One of these five ferruginous hawk nests was used by a golden eagle in 1998.
2 Artificial nesting structure for ferruginous hawks
3 One of the active ferruginous hawk ANSs was used by a Swainson's hawk in 1998.
4 Artificial nesting structure for red-tailed hawks
5 This Swainson's hawk nest was used by a golden eagle in 1998.

Five of the six active natural ferruginous hawk nests successfully produced young to fledging age and 12 of the 14 active ferruginous ANSs were successful. The five successful natural nests produced 13 young to fledging age and the unsuccessful nest had no eggs when abandoned. The 12 successful ferruginous hawk ANSs produced 36 young to fledging age. Of the two ANSs which failed, one had no eggs when abandoned, and the other was abandoned with four eggs. A complete listing of nests surveyed in the rest of the GDRA is located Appendix 2C.

Table 2D combines data from tables 1A, 2A, 2B, and 2C to summarize raptor nest monitoring for the entire Great Divide Resource Area for 1998. As stated in the summary at the beginning of this report, 67 ferruginous hawk nests were active at the beginning of the nesting season. A total of 13 nesting pairs failed to produce young to fledging age (they abandoned nests without eggs, with eggs and in one case with three young). Fifty-four nesting pairs were successful in raising young to fledging age. Forty artificial nests (38 ferruginous hawk ANSs and 2 golden eagle ANSs) produced 118 young and the remaining 14 natural nests produced 44 young. Of the total of 162 young produced, 141 were banded; the remaining 21 were inaccessible.

TABLE 2D
SUMMARY OF RAPTOR NESTS MONITORED
GREAT DIVIDE RESOURCE AREA
ALL AREAS MONITORED
1998

Species	Total # of Nests Searched For	# of Known Nests Found; not Active	# of Known Nests No Longer There	# of Known Nests not Found	# of Known Nests Found Active	# of New Nests Found Active	# of New Nests Not Active	# of Active Nests Abandoned Or Failed
Ferruginous Hawk	582	424	24	72	14[1]	8	40	5
Ferruginous Hawk ANS[2]	81	35	0	0	46	0	0	8
Golden Eagle	82	51	2	11	8	3	7	0
Golden Eagle ANS[3]	8	4	0	0	4[4]	0	0	0
Prairie Falcon	22	2	0	10	6	4	0	0
American Kestrel	16	0	1	7	4	4	0	0
Red-Tailed Hawk	27	8	1	10	5	3	0	0
Red-Tailed Hawk ANS[5]	1	0	0	0	1	0	0	0
Burrowing Owl	9	5	1	1	1	1	0	0
Great Horned Owl	6	1	0	4	1	0	0	0
Northern Harrier	3	0	1	2	0	0	0	0
Swainson's Hawk	3	1	0	1	1[6]	0	0	0
Unidentified Raptor	9	2	0	4	0	0	3	0
Totals	849	533	30	122	91	23	50	13

1 Three of these nests was used by a golden eagles in 1998.
2 Artificial nesting structure for ferruginous hawks.
3 Artificial nesting structure for golden eagles.
4 Two of these golden eagle ANSs were used by ferruginous hawks in 1998.
5 Artificial nesting structure for red-tailed hawks.
6 This Swainson's hawk nest was used by a golden eagle in 1998.

APPENDIX 2A

RAPTOR NEST MONITORING
CONTINENTAL DIVIDE/GREATER WAMSUTTER II EIS AREA
NORTH OF I-80
1998

Legend for Appendix 2A

Raptor nests shown in black ink are old, known nests monitored or reinventoried during this years efforts.

Raptor nests shown in green ink are newly discovered nests which are being added to the inventory as a result of this year's inventory/ monitoring efforts.

Raptor nests shown in red ink are old nests which have deteriorated to an extent that they are no longer identifiable nests. These nests are recommended for removal from the inventory.

APPENDIX 2A

Raptor Nest Monitoring -- CD-GWII - 1998
Jody Simoes, Adam Nelson

"North of I-80"

Nest Number	Date	Status	Condition/Comments
Range 92			
FH20920702	05-26-98	Inactive	Excellent; predated?
FH20920703	05-26-98	Inactive	Good
FH21920401	05-26-98	Inactive	Poor (RFI)
FH21920402	05-26-98	Inactive	Fair
FH21921401	05-26-98	?	Not found
FH21923001	05-26-98	?	Did not check, too close to active artificial nest; presumed inactive
AFH21923002	04-15-98	Active	Excellent, 3 young banded/fledged
GE21923201	05-26-98	Inactive	Gone (RFI)
FH22920401	06-22-98	Inactive	
FH22920402	06-22-98	Inactive	
FH22920403	06-22-98	Inactive	
FH22920501	06-22-98	Inactive	
FH22920502	06-22-98	Inactive	
FH22920701	06-22-98	Inactive	
FH22920801	06-22-98	Inactive	Good
FH22921501	06-09-98	Inactive	Gone (RFI)
GH22921501	06-09-98	Active	In barn, no nest, one chick
KE22921501	06-09-98	Inactive	Gone, Owl in barn
FH22922701	06-09-98	Inactive	Fair
FH22922702	06-09-98	Inactive	Poor (RFI)
FH22922703	06-09-98	Active	At least 3 chicks; 4 young banded/ fledged
FH23921301	06-25-98	Inactive	Poor (RFI)
FH23922201	06-25-98	Inactive	Good
FH23922202	06-25-98	Inactive	Good
FH23922203	06-25-98	Inactive	Excellent
FH23922301	06-25-98	Inactive	Fair, new nest
FH23922401	06-25-98	?	Not Found
FH23922901	06-25-98	?	Not Found
Range 93			
FH20930401	06-09-98	Inactive	Poor, (RFI)
FH20930901	06-09-98	Inactive	Excellent
FH20930902	06-09-98	Inactive	Fair
FH20930903	06-09-98	?	Not found
FH20931401	05-26-98	Inactive	Good
FH20931402	05-26-98	Inactive	Fair
FH20931403	05-26-98	Inactive	Good
FH20931501	05-26-98	Inactive	Fair(ground squirrel skull)
FH20931502	05-26-98	Inactive	Good
FH20931503	05-26-98	Inactive	Good
FH20931504	05-26-98	Inactive	Poor
FH20931601	06-09-98	Inactive	Good
FH20931602	06-09-98	?	Not found (RFI)
FH21930401	05-22-98	?	Not found
FH21930901	05-22-98	Inactive	Good
FH21930902	05-22-98	Inactive	Fair, new nest
KE22930301	06-24-98	Inactive	Not found
FH22930701	06-24-98	Inactive	Excellent, new nest
FH22931001	06-24-98	Inactive	Fair, new nest
FH22931901	05-20-98	Inactive	Good

Nest Number	Date	Status	Condition/Comments
Range 93 (Cont)			
FH22931902	05-20-98	Inactive	Poor (RFI)
FH22933101	05-22-98	Inactive	Structure destroyed (RFI)
BO22933301	05-22-98	Inactive	Holes found, no activity
FH22933301	05-22-98	Inactive	Structure destroyed (RFI)
Range 94			
FH20941601	05-20-98	Inactive	Good
FH20941602	05-20-98	Inactive	Fair
FH20941603	05-20-98	Inactive	Excellent, new nest
FH20942301	06-09-98	Inactive	Good
FH21940101	05-22-98	Inactive	Good
BO21940201	05-20-98	Inactive	Holes found; no activity
AFH21940302	05-01-98	Inactive	Good; no activity observed
AFH21940303	05-01-98	Active	Excellent; 4 young banded/fledged
FH21940304	05-20-98	Inactive	Good
FH21941201	05-22-98	Inactive	Good/Excellent, but shallow nest cup
AFH21941202	05-01-98	Inactive	Fair
AFH21941203	05-01-98	Active	Excellent; 2 young banded/fledged
FH22940201	06-24-98	Inactive	Excellent, large nest 3 eggs
FH22940902	06-11-98	?	Not found
FH22941201	06-24-98	Inactive	Excellent
FH22941901	05-20-98	Inactive	Not found
FH22942201	05-20-98	Inactive	Poor
NH22942201	05-20-98	?	Not found
FH22942301	05-20-98	Inactive	Structure destroyed (RFI)
FH22942302	05-20-98	Inactive	Fair
AFH23942304	05-01-98	Inactive	Good
FH22942401	05-20-98	Inactive	Did not check, too close to active artificial nest; presumed inactive
AFH22942404	05-01-98	Active	Excellent; 4 young banded/fledged
FH22942405	05-20-98	?	Did not check, too close to active artificial nest; presumed inactive
FH22943001	05-20-98	Inactive	Fair
FH22943002	05-20-98	Inactive	Poor
FH22943003	05-20-98	Inactive	Good, new nest
FH23941501	06-11-98	?	Not found
AFH23942001	04-29-98	Inactive	Fair/Good
FH23942201	06-11-98	Inactive	Poor (RFI)
FH23942202	06-11-98	Inactive	Fair
FH23942203	06-11-98	Inactive	Poor
AFH23942204	04-29-98	Inactive	Good
FH23942601	06-11-98	Inactive	Poor (RFI)
FH23942602	06-11-98	Inactive	Excellent, new nest
BO23942702	06-11-98	?	Not found
FH23942701	06-11-98	Inactive	Fair
FH23942702	06-11-98	Inactive	Excellent, new nest
FH23942703	06-11-98	Inactive	Good, new nest
AFH23942802	04-29-98	Active	Excellent; 4 young banded/fledged
FH23943501	06-11-98	Inactive	Poor
Range 95			
FH20953401	06-08-98	Inactive	Excellent; good cup
FH20953402	06-08-98	Inactive	Fair
FH20953501	06-08-98	Inactive	Fair
FH22950301	06-11-98	Inactive	Fair
FH22950302	06-11-98	Inactive	Good
FH22950303	06-11-98	Inactive	Fair, new nest
FH22950401	06-11-98	Inactive	Poor (RFI)
FH22950402	06-11-98	Inactive	Poor (RFI)
FH22950501	06-11-98	?	Not found
FH22950601	06-11-95	Inactive	Poor

Nest Number	Date	Status	Condition/Comments
Range 95 (cont)			
FH22952101	05-19-98	Inactive	Fair
FH22952201	05-19-98	Inactive	Good
FH22952701	05-19-98	Inactive	Good
FH22953601	05-20-98	Inactive	Good
FH23952601	06-11-98	Inactive	Poor (RFI)
FH23953202	06-11-98	?	To close to active artificial nest; presumed inactive
AFH23953203	05-01-98	Active	Excellent; 2 young banded/fledged
FH23953204	06-11-98	Inactive	Not found (RFI)
FH23953205	06-11-98	Inactive	Good
FH23953401	06-11-98	?	Not found
BO23953501	06-11-98	Inactive	Gone (RFI)
FH23953501	06-11-98	?	Not found
FH23953502	06-11-98	Inactive	Good
FH24950401	05-28-98	Inactive	Not found, (RFI)
FH24951601	05-28-98	Inactive	Good
FH25950201	05-28-98	Inactive	Poor (RFI)
AFH25950801	04-29-98	Active	Excellent; 2 young banded/fledged
FH25951101	05-28-98	Inactive	Poor (RFI)
AFH25951201	04-29-98	Active	Good; nest later abandoned
FH25953501	05-28-98	Inactive	Fair
AFH25953502	04-29-98	Active	Good; 1 young banded/fledged
FH26951801	05-28-98	Inactive	Not Found, (RFI)
AFH26952901	04-29-98	Active	Excellent; 3 young banded/fledged
AFH26953402	04-29-98	Active	Good, nest later abandoned
Range 96			
UR21963301	05-19-98	?	Not found
UR21963302	05-19-98	?	Not found
FH22960201	06-11-98	Inactive	Fair
FH22961701	06-10-98	Inactive	Good, nest on roof
FH22962801/ GE22962801	05-19-98	Inactive	Structure destroyed (RFI)
AFH23960602	05-01-98	Inactive	Good
FH23960801	06-10-98	Inactive	Excellent
AFH23961302	05-01-98	Active	Excellent;4 young banded/fledged
FH23961401	06-11-98	Inactive	Poor (RFI)
FH23961402	06-11-98	Inactive	Poor (RFI)
NH23962501	06-11-98	?	Not found
FH23962701	06-10-98	Inactive	Fair
FH23962702	06-10-98	Inactive	Poor
FH23962703	06-10-98	Inactive	Fair
FH24961901	05-29-98	Inactive	Excellent (in tree)
FH24961902	05-29-98	Inactive	Poor Tree Down(RFI)
FH24961903	05-29-98	Inactive	Poor (RFI)
AGE23963402	05-01-98	Inactive	Good
FH24963501	06-10-98	Inactive	Excellent
Range 97			
FH20971101	05-19-98	Inactive	Good
FH20971102	05-19-98	Inactive	Fair
KE20972701	05-19-98	Active	Female on nest,nest in airvent
FH23970301	05-29-98	Inactive	Poor (RFI)
FH23970401	05-29-98	Inactive	Poor; structure destroyed(RFI)
FH23970402	05-29-98	Inactive	Good; large nest
FH24971001	05-01-98	Active	New nest on old condensation tank
〃	06-03-98	Active	4 young, 9-15 days old; young banded
FH24971601	06-10-98	Inactive	Good
FH24971602	06-10-98	Inactive	Fair
FH24971701	06-10-98	Inactive	Poor
FH24972301	05-29-98	Inactive	Poor (RFI)

Nest Number	Date	Status	Condition/Comments
Range 97 (Cont)			
FH24972302	05-29-98	Inactive	Poor; large flat pile
FH24973401	05-29-98	Inactive	Fair
FH24973402	05-29-98	Inactive	Fair
FH24973403	05-29-98	Inactive	Fair
FH24973404	05-29-98	Inactive	Poor
FH24973405	05-29-98	Inactive	Fair
PF24973401	05-29-98	Inactive	Excellent
FH25970101	05-28-98	Inactive	Poor (RFI)
FH25970401	05-27-98	Inactive	Poor, new nest
FH26972201	05-27-98	?	Not found
FH26972301	05-27-98	Inactive	Poor; large nest
BO26973601	05-28-98	Inactive	Holes found; no activity
Range 98			
FH26982501	05-27-98	Inactive	Fair

APPENDIX 2B

RAPTOR NEST MONITORING
CONTINENTAL DIVIDE/GREATER WAMSUTTER II EIS AREA
SOUTH OF I-80
1998

Legend for Appendix 2B

Raptor nests shown in black ink are old, known nests monitored or reinventoried during this years efforts.

Raptor nests shown in green ink are newly discovered nests which are being added to the inventory as a result of this year's inventory/ monitoring efforts.

Raptor nests shown in red ink are old nests which have deteriorated to an extent that they are no longer identifiable nests. These nests are recommended for removal from the inventory.

APPENDIX 2B

Raptor Nest Monitoring -- CDGWII / 1988
Ruthanne Watkinson, Laura Barjaktarovic

"South of I-80"

Nest Number	Date	Status	Condition/Comments
Range 91			
FH13910501	06-26-98	?	Did not find
RT13910501	06-30-98	Active	3 young
FH13910701	06-26-98	Inactive	Taken over by magpie (RFI)
GE13910901	06-26-98	Inactive	Fair
RT13913301	06-26-98	Active	Excellent
Range 92			
AGE12920402	04-27-98	Inactive	Reported by Tim Woolley (WGFW)
RT12920601	07-02-98	Inactive	Fair-good
RT12920602	07-02-98	Inactive	Good
UR12921101	06-26-98	?	Not found (RT calling)
GE12921701	07-05-98	?	Did not find
RT12921701	07-05-98	?	Did not find
RT12921702	07-05-98	?	Did not find
RT12921703	07-05-98	?	Did not find
RT12922201	07-05-98	?	Did not find
BO13920201	06-26-98	Inactive	Holes found, no sign of activity
RT14920701	07-01-98	Inactive	Poor blown down (RFI)
FH15920501	06-15-98	Inactive	Poor (RFI)
FH15920502	06-15-98	Inactive	Good
AFH15920503	04-27-98	Active	Nest failure; infertile eggs
AGE15920801	04-27-98	Inactive	Good
FH15921601	06-24-98	Active	Excellent, 4 young on nest, too high to band
GE15921601	06-29-98	Inactive	Condition unknown
GE15921602	06-29-98	Active	32 days
FH16920401	06-30-98	Inactive	Good
FH16920402	06-30-98	Inactive	Poor
KE16920401	06-30-98	Active	Same rock as FH16920401(new)
GE16920501	06-29-98	Inactive	Fair
GE16920502	06-29-98	Inactive	Good
FH16920701	06-29-98	Inactive	Good
PF16921601	06-29-98	?	Did not find (RFI)
FH16922802	06-29-98	?	Did not find (RFI)
GE16922901	06-29-98	Inactive	Good
FH16923301	06-29-98	Inactive	Fair
FH17920901	06-10-98	Inactive	Excellent, good cup
FH17920902	06-10-98	Inactive	Poor (RFI)
FH17921001	06-12-98	Inactive	Fair-good
FH17921002	06-12-98	Active	4-5 chicks, no pinfeathers, just down; 4 young banded/fledged
FH17921701	06-30-98	Inactive	Fair
FH17921702	06-30-98	Inactive	Poor
FH17921703	06-30-98	Inactive	Poor
FH17922002	06-30-98	Inactive	Poor (RFI)
FH17922701	06-30-98	Inactive	Poor
FH17922702	06-29-98	?	Did not find (RFI)
FH17922703	06-29-98	Inactive	Fair
FH17922704	06-29-98	Inactive	Poor
FH17922705	06-29-98	Inactive	Poor
FH17922706	06-30-98	Inactive	Good
FH17923301	06-30-98	?	Did not find (RFI)
GE17923301	06-30-98	?	Did not find (RFI)

Nest Number	Date	Status	Condition/Comments
Range 92 (Cont)			
FH17923401	06-30-98	Inactive	Poor (RFI)
FH17923402	06-30-98	Inactive	Poor fell out of tree (RFI)
FH17923404	06-30-98	Inactive	Poor
FH17923407	06-30-98	Inactive	
GE17923401	06-30-98	Inactive	Poor (RFI)
AFH18921801	05-29-98	Active	Excellent; 5 young banded/fledged
Range 93			
GH12930401	07-09-98	?	Did not find
GE12930701	06-24-98	?	Did not find
FH13930701	06-24-98	Inactive	Excellent
FH13930801	06-24-98	Inactive	Poor (RFI)
FH13931001	07-01-98	Inactive	Good
FH13931002	07-01-98	Inactive	Good
FH13931003	06-26-98	Inactive	Good
FH13931004	06-26-98	Inactive	Poor
FH13931005	07-01-98	Inactive	Good (new)
RT13931001	07-01-98	Active	Excellent(new)
GE13931501	06-26-98	?	Did not find
GE13931502	06-26-98	?	Did not find
GE13931601	06-26-98	?	Did not find
GE13931602	06-26-98	Inactive	Good (new)
FH13932001	06-25-98	Inactive	Poor (RFI)
GE13932101	06-26-98	Inactive	Fair (2 nests in tree)
PF13932101	06-25-98	?	Did not find (RFI)
PF13932102	06-26-98	Active	Didn't see chicks in nest (new)
RT13932101	06-26-98	Inactive	Fair-good
RT13932102	06-26-98	Active	1 young (new)
GE14930501	06-24-98	Inactive	Poor
FH15930101	07-01-98	Inactive	Excellent (new)
BO15930301	06-29-98	Inactive	Hole found, no sign of activity
FH15930501	06-11-98	?	Not found (RFI)
FH15930502	06-11-98	?	Not found (RFI)
FH15930503	06-11-98	Inactive	
FH15930504	06-11-98	Inactive	Good (new)
FH15930801	06-11-98	Inactive	Good
FH15930802	06-11-98	Inactive	Good-excellent
FH15930901	04-27-98	Active	Female apparently on eggs
"	06-11-98	Inactive	Good, on top of board on an erosion remnant, nest abandoned, no eggs
FH15930902	06-11-98	Inactive	Poor
FH15930903	06-11-98	Inactive	Poor
FH15931701	06-22-98	Inactive	Good-excellent (new)
PF15932101	06-29-98	?	Did not find
RT15933501	07-01-98	Active	Excellent
FH16930201	05-27-98	Active	New nest on condensation tank, later abandoned
FH16930301	06-30-98	Inactive	Poor (RFI)
FH16931101	06-22-98	Inactive	Good (FH on nest)
FH16932001	06-10-98	Active	Excellent, nest later abandoned
GE16933101	06-12-98	Active	Excellent
PF16933101	06-10-98	Inactive	Not found
RT16933101	06-10-98	Active	Golden eagle
FH16933201	06-12-98	Inactive	Fair-good
AFH17931002	05-29-98	Active	Excellent; 3 young banded/fledged
AFH17931402	05-29-98	Active	Excellent; 3 young banded/fledged
FH17931501	05-29-98	Active	Nest on condensation tank instead of on AFH17931601; 4 young banded/ fledged

Nest Number	Date	Status	Condition/Comments
Range 93 (Cont)			
AFH17931601	05-29-98	Inactive	Magpie nest below ANS platform, may have caused hawks to nest on FH17931501
FH17932601	05-27-98	Active	New nest on old condensation tank; 3 young banded/fledged
GE17933302	05-29-98	Inactive	fair
AGE17933401	05-29-98	Active	Adult on nest; ? young
AFH18930601	04-16-98	Active	Excellent; 4 young banded/fledged
FH18930801	06-15-98	Inactive	Poor (RFI)
FH18930802	06-15-98	?	Not found (RFI)
FH18931401	06-15-98	?	Not found (RFI)
AGE18931601	04-11-98	Active	FH on nest; 4 young fledged; too high to band
AFH18932101	04-16-98	Inactive	Fair-good
FH18932401	06-15-98	Active	New nest on separator housing, 3 young on nest, banded
AGE18932701	05-29-98	Inactive	Good
FH18932901	06-08-98	Active	New nest on condensation tank, 3 young on nest, banded
AFH19933201/ AGE19933201	04-16-98	Inactive	Fair
AGE19933302	06-08098	Active	FH on nest; 4 young fledged; too high to band
FH20932001	05-27-98	Inactive	Fair
FH20932002	05-27-98	Inactive	Poor
FH20932003	05-27-98	Inactive	Poor
FH20932004	05-27-98	Inactive	Poor (RFI)
FH20932005	05-27-98	Inactive	Poor
FH20932006	05-27-98	Inactive	Poor
FH20932007	05-27-98	?	Did not find (RFI)
FH20932008	05-27-98	Inactive	Poor-fair
FH20932009	05-27-98	?	Did not find (RFI)
FH20932010	05-27-98	Inactive	Good (new)
FH20932101	05-27-98	?	Did not find (RFI)
FH20932102	05-27-98	?	Did not find (RFI)
FH20932801	05-27-98	Inactive	Poor
FH20932802	05-27-98	Inactive	Fair
Range 94			
FH12941101	06-24-98	Inactive	Poor (windmill-RFI)
KE13940301	07-06-98	Active	New
PF13941001	07-06-98	Active	New (2 young)
GE13941301	06-24-98	Inactive	Good
GE13941302	06-24-98	Inactive	Poor (RFI)
GE13941303	06-24-98	Inactive	Poor (RFI)
GE13941304	06-24-98	Inactive	Good
GH13941301	06-24-98	Inactive	Did not find (RFI)
GE13943301	06-24-98	Inactive	Did not find (RFI)
PF13943401	06-24-98	Active	3 young
RT13943402	06-24-98	Inactive	Did not find (RFI)
GE14940101	07-06-98	Active	Excellent (new)
FH14940301	07-06-98	?	Did not find
FH14940302	07-06-98	Inactive	Poor-fell w/ rocks(RFI)
FH14940303	07-06-98	Inactive	Fair-good
GE14941101	07-09-98	Inactive	Good
GE14943301	07-06-98	Inactive	Poor (RFI)
GE14943302	07-06-98	Inactive	Fair-good
GE14943303	07-06-98	Inactive	Poor (RFI)
KE14943301	07-06-98	?	Did not find
FH15940401	06-12-98	Inactive	Poor (RFI) nest fallen
FH15940501	06-23-98	Inactive	Poor

Nest Number	Date	Status	Condition/Comments
Range 94 (Cont)			
FH15940601	06-23-98	Inactive	Fair-good
KE15940601	06-23-98	?	Did not find
PF15940601	06-23-98	?	Did not find
KE15940801	06-23-98	?	Did not find
RT15940801	06-23-98	?	Did not find (RFI)
RT15940802	06-23-98	Inactive	Fair-good
FH15942101	06-11-98	Inactive	Poor
FH15942102	06-11-98	Inactive	Excellent-good
GH15942101	06-11-98	?	Not found
GH15942102	06-11-98	?	Not found
KE15942101	06-11-98	?	Not found
PF15942102	06-11-98	?	Not found
PF15942103	06-11-98	Active	At least 4 chicks
RT15942101	06-11-98	Inactive	Poor
RT15942102	06-11-98	Inactive	Poor (RFI)
FH15942201	06-11-98	Inactive	Good (new) photo #8
RT15943101	06-10-98	Inactive	Fair-good
UR16943101	06-23-98	Inactive	Fair (new)
FH16942101	06-22-98	Inactive	Poor (blown down-RFI)
FH16942801	06-22-98	Inactive	Fair
FH16942802	06-22-98	?	Not found (RFI)
FH16942803	06-22-98	Inactive	Poor
FH16943101	06-23-98	?	Poor (move on map)
GE16943101	06-23-98	Inactive	Good
PF16943101	06-23-98	?	Did not find
RT16943101	06-23-98	?	Did not find (RFI)
FH16943401	06-12-98	Inactive	Poor (RFI)
FH16943402	06-12-98	?	Not found (RFI)
FH16943403	06-12-98	Inactive	Fair
FH16943404	06-22-98	Inactive	Poor (RFI)
FH16943405	06-22-98	Inactive	Poor (RFI)
FH16943501	06-22-98	Inactive	Fair
FH17940601	05-19-98	?	Did not find (RFI)
FH17940602	05-19-98	Inactive	Poor
FH17940603	05-26-98	Active	Good, 3 young, nest later abandoned
FH17940604	05-22-98	Inactive	Fair (new)
GE17940601	05-19-98	?	Did not find (RFI)
UR17940601	05-19-98	Inactive	Fair (new)
FH17940801	05-26-98	?	Did not find (RFI)
AGE17941802	05-29-98	Active?	Adult on nest; ? young
FH17942101	05-22-98	Inactive	Fair
FH17942105	05-22-98	Inactive	Fair
FH17942106	05-26-98	Inactive	Poor-fair (new- difficult to see)
GE17943301	05-22-98	Active(?)	Bird close to area
FH18943001	05-19-98	Inactive	Good-fair
FH18943002	05-19-98	Inactive	Poor (RFI)
FH18943004	05-19-98	Inactive	Fair (new)
FH18943102	05-19-98	?	Did not find (RFI)
FH19940701	05-28-98	Inactive	Poor (RFI)
FH19940801	05-28-98	Inactive	Poor (RFI)
FH19941601	05-28-98	Inactive	Poor (RFI)
FH19942602	05-28-98	?	Did not find (RFI)
AFH19942801	05-28-98	Inactive	Fair-good
Range 95			
FH16950201	05-20-98	Inactive	Fair
FH16950202	05-20-98	?	Did not find
FH16950203	05-20-98	Inactive	Fair (new)
GE16950201	05-20-98	Inactive	Fair
GE16952601	06-23-98	Inactive	Fair-poor
GE16952602	06-23-98	Inactive	Poor

Nest Number	Date	Status	Condition/Comments
Range 95 (Cont)			
FH16953501	06-23-98	Inactive	Fair-good (new)
FH16953601	06-23-98	?	Did not find
FH17950601	05-20-98	Inactive	Good
FH17950602	05-20-98	?	Did not find (RFI)
GE17952601	05-20-98	Inactive	Fair
GE17952701	05-20-98	Inactive	Fair
GE17952702	05-20-98	Inactive	Good
FH17953601	05-22-98	?	Did not find (RFI)
GE18950301	05-13-98	Inactive	Good
FH18950401	05-13-98	?	Did not find (RFI)
FH18950402	05-13-98	?	Did not find (RFI)
FH18950403	05-13-98	?	Did not find (RFI)
KE18950401	05-13-98	Active	(New)
FH18951001	05-14-98	Inactive	Outcrop fell (RFI-photo)
FH18951002	05-14-98	Inactive	
FH18951004	05-14-98	Inactive	Excellent (new-photo)
FH18951005	05-14-98	Inactive	Excellent (new-photo)
GE18951001	05-14-98	Inactive	
KE18951001	05-14-98	Active	(New-photo)
PF18951001	05-14-98	Active	Excellent (new-photo)
GE18951401	05-14-98	Inactive	Poor
GE18951402	05-14-98	?	Did not find
GE18951403	05-14-98	Inactive	Poor (RFI)
GE18951404	05-14-98	Inactive	Poor (new)
GE18951501	05-14-98	Inactive	Good (new)
FH18951502	05-14-98	?	Did not find
FH18951503	05-14-98	Inactive	Good (new)
FH18952401	05-14-98	Inactive	Excellent
FH18952402	05-14-98	?	Did not find (RFI)
FH18952403	05-14-98	Inactive	Excellent (new)
GE18952401	05-14-98	Inactive	Excellent/large
GE18952402	05-14-98	Active(?)	Excellent (new)
FH18952501	05-19-98	?	Did not find (RFI)
FH18952502	05-14-98	Inactive	Fair (new)
PF18952501	05-19-98	Active	(New)
FH18952601	05-18-98	Inactive	Good (new)
FH18952701	05-18-98	Inactive	Excellent
FH18952702	05-18-98	?	Did not find (RFI)
FH18952703	05-18-98	Inactive	Excellent (new)
FH18953501	05-18-98	Inactive	Fair (new)
FH19950201	05-12-98	Inactive	Good
FH19950301	05-12-98	Inactive	Good
FH19950801	05-12-98	Inactive	Fair
FH19952101	05-13-98	Inactive	Excellent (egg shells found)
FH19952801	05-13-98	Inactive	Poor
FH19952802	05-13-98	Inactive	Poor(new)
FH19952803	05-13-98	Inactive	Poor (new)
PF19953301	05-13-98	?	Did not find
Range 96			
FH18960601	05-08-98	Inactive	Fair
FH18960602	05-08-98	Inactive	Poor
FH18960603	05-08-98	?	Did not find
FH18960604	05-08-98	?	Did not find
GE18960601	05-08-98	Inactive	Poor(muddy/RFI)
GE18960602	05-08-98	Inactive	Good
BO19960201	05-11-98	Active	Excellent (new)
FH19960302	05-11-98	Inactive	Good
FH19960303	05-11-98	Inactive	Fair (new)
FH19960401	05-11-98	Inactive	Poor
FH19960402	05-11-98	Inactive	Excellent/large

Nest Number	Date	Status	Condition/Comments
Range 96 (Cont)			
FH19960403	05-11-98	?	Did not find
FH19960501	05-11-98	Inactive	Good
FH19960901	05-12-98	Inactive	Poor
FH19960902	05-12-98	Inactive	Good
FH19960903	05-12-98	Inactive	Fair
FH19961001	05-12-98	Inactive	Fair
FH19961002	05-12-98	Inactive	Excellent/large
FH19961003	05-12-98	Inactive	Fair
FH19961004	05-11-98	Inactive	Poor (RFI)
FH19961006	05-12-98	Inactive	Poor (RFI)
FH19961007	05-12-98	Inactive	Good
FH19961101	05-12-98	Inactive	Good
FH19961501	05-12-98	Inactive	Fair
FH19961502	05-12-98	Inactive	Good
FH19961601	05-12-98	?	Did not find (RFI)
GE19963201	05-08-98	Inactive	Fair
FH19963301	05-08-98	Inactive	Blown down (RFI)
FH19963302	05-08-98	Inactive	Good
FH20962701	05-11-98	Inactive	Good
GE20962701	05-11-98	Inactive	Poor (new)
UR20962701	05-11-98	Inactive	Good (PF or KE/new)
FH20963301	05-11-98	Inactive	Good
Range 97			
FH19971401	05-07-98	Inactive	Fair(small cup/bones)
FH19972201	05-07-98	Inactive	Poor(blown down/RFI)
FH19972202	05-07-98	Inactive	Fair
FH19972203	05-07-98	Inactive	Poor (RFI)
FH19972204	05-07-98	Inactive	Excellent
PF19972801	05-08-98	Active(?)	Bird seen above nest cliff
GE19972901	05-07-98	Active	Excellent
GE19972902	05-07-98	Inactive	Excellent
GE19972903	05-07-98	Inactive	Good
GE19972904	05-07-98	Inactive	Blown down (RFI)

APPENDIX 2C

RAPTOR NEST MONITORING
THE REST OF THE GREAT DIVIDE RESOURCE AREA
1998

Legend for Appendix 2C

Raptor nests shown in black ink are old, known nests monitored or reinventoried during this years efforts.

Raptor nests shown in green ink are newly discovered nests which are being added to the inventory as a result of this year's inventory/ monitoring efforts.

Raptor nests shown in red ink are old nests which have deteriorated to an extent that they are no longer identifiable nests. These nests are recommended for removal from the inventory.

APPENDIX 2C

Raptor Nest Monitoring - Natural Nests
Nests Associated with Other Monitoring Efforts
1998

Nest Number	Date	Status	Condition/Comments
Range 78			
FH23780901	05-12-98	Inactive	Poor; very close to Highway 487
FH24780402	05-12-98	Active	Excellent; in cottonwood tree; 3 young banded/fledged
FH24781001	05-12-98	Active	Good; on old windmill; 4 young banded/fledged
AH24781205/ AGE24781201	05-12-98	Inactive	Fair
AFH24781206	05-12-98	Inactive	Fair
AFH24782401	05-12-98	Inactive	Fair
Range 79			
GE21790201	06-23-98	Active	2 eaglets on nest
FH22792601	05-12-98	Active	Nest on old windmill; 2 young banded/fledged
Range 80			
FH22800201	05-12-98	Inactive	Poor
FH22800301	05-12-98	Inactive	Fair
FH22800302	05-12-98	Inactive	Poor
FH22800401	05-12-98	Inactive	Good; one adult seen in area
	06-22-98	Active	2-3 young, 24-26 days old; 3 young banded/fledged
FH22800402	05-12-98	Active	Female incubating; later abandoned
RT22803401	06-23-98	Active	Number of young not determined
Range 81			
FH22811201	05-12-98	Inactive	Good
FH22811202	05-12-98	Inactive	Good
SH22812201	05-12-98	Active	Golden eagle on nest
Range 83			
AFH19832002	05-12-98	Active	Excellent; 4 young banded/fledged
GE21832001	05-12-98	Inactive	Coyote Springs nest, good condition
GE21832002	05-12-98	Active	1 or 2 young on nest with 1 adult
Range 84			
FH21842502	05-12-98	Active	Fair/good, nest on power pole; 1 young fledged (not banded) youn
Range 86			
GE22861301	03-24-98	Active	New nest overlooking N. Platte river
Range 88			
GE21880301	06-23-98	Inactive	Fair
GE21880302	06-23-98	?	Did not find
GE21882601	06-23-98	Active	1 bird at nest; immature?
FH21882801	06-23-98	Inactive	Excellent
Range 89			
ART27893401	04-24-98	Active	Excellent; at last 1 young
Range 90			

Nest Number	date	Status	Condition/Comments
Range 90 (Cont)			
GE19900801	06-30-98	Inactive	Excellent. large nest
RT19900801	06-30-98	?	Did not find
GE19900904	06-30-98	Inactive	Poor
GE19900905	06-30-98	Inactive	Fair
GH19900901	06-30-98	Inactive	Fair
KE19900901	06-30-98	Active	
PF19900901	06-30-98	Active	
PF19900902	06-30-98	Active	3 chicks in nest
RT19900901	06-30-98	?	Did not find
RT19900902	06-30-98	?	Did not find
FH20902801	06-30-98	Inactive	Poor; partially fallen
FH20903301	06-30-98	Inactive	Excellent. large nest, good cup
FH21900501	07-01-98	?	Did not find
FH22902901	07-01-98	Inactive	Excellent
UB22902901	07-01-98	Inactive	Good
FH22902902	07-01-98	Inactive	Good
SH22903001	07-01-98	?	Did not find
ASH26901202[1]	06-19-98	Inactive	Good
Range 91			
AFH14911201	04-27-98	Active	Excellent; 3 young banded/fledged
AFH20910501	03-24-98	Active	Adult on nest
	06-15-98	Active	Excellent; 4 young fledged; too high to band from this nest
AFH21913303	06-16-98	Active	Excellent; used by Swainson's hawk
AFH23910202	04-28-98	Active	Excellent; 2 young banded/fledged
AFH23910801	04-28-98	Active	Good
"	06-20-98	Inactive	Abandoned, 3 eggs in nest
AFH24910801	04-28-98	Active	Excellent; 3 young banded/fledged
AFH24911501	04-15-98	Inactive	Good
AFH24913402	04-28-98	Active	Good; 3 young banded/fledged
AFH25912601	04-29-98	Inactive	Good
AFH25912802	04-29-98	Active	Good; 4 young banded/fledged
Range 92			
FH15921710	04-27-98	Inactive	Good
FH17920402	04-27-98	Inactive	Good; some sticks have fallen
GE17922401	06-24-98	Active	1 eaglet in nest
FH17922902	04-27-98	Inactive	Good; improved since '97, but no adults present
FH18922301	04-27-98	Inactive	Good
FH18922302	04-27-98	Inactive	Good
FH18922303	05-27-98	Inactive	Good; new nest, in badlands
FH18922601	05-27-98	Inactive	Poor; in willow tree, may be magpie
RT18922601	05-27-98	Active	Good; on condensation tank
FH18922807	04-02-98	Inactive	Fair
FH18922901	04-02-98	Inactive	Fair
FH18922902	04-02-98	Inactive	Fair
FH18923102	04-02-98	Inactive	Good
GE18923301	04-02-98	Active	Female apparently on eggs
AFH23920801	04-28-98	Active	Good; 4 young banded/fledged
AFH24920501	04-29-98	Active	Good; 2 young banded/fledged
AFH24921801	04-15-98	Active	Good; 3 young banded/fledged
AFH25921004	04-29-98	Active?	One adult present
	06-11-98	Inactive	Nest abandoned
AFH25922802	04-29-98	Active	Excellent; 2 young banded/fledged
AFH25923203	04-29-98	Active	3 adults near nest
	06-11-98	Active	4 eggs in nest
	06-30-98	Inactive	Nest abandoned; 4 eggs, no adults
AFH25923502	04-29-98	Active	Good; 2 young banded/fledged

Nest Number	date	Status	Condition/Comments
Range 93			
FH18932103	05-29-98	Active	Golden eagle on condensation tank
GE19930701	05-27-98	Active	New nest on condensation tank, at least 1 young
Range 94			
FH12941101	04-23-98	Inactive	Old nest on old windmill
Range 97			
FH20971001	04-10-98	Inactive	New nest on inventory, in good condition

[1] This nest was originally designated a Swainson's hawk ANS, but has been used most often by ferruginous hawks. The designation may be changed to AFH26901202 in future reports.

Part 3

Artificial Nesting Structure Update - 1987 Through 1998

When the first artificial structures were built in 1987-89, they were placed in clusters of two or three to simulate the arrangement of natural, alternately-used nests within a ferruginous hawk territory. In many cases, the birds often prefer to use one structure predominately, and one or more of the nests in the cluster remains unused. Over the years, several of these unused ANSs have been relocated to sites where conflicts, primarily with oil and gas development, have arisen. One ANS was relocated into a ferruginous hawk territory in the fall of 1996 but was used by a golden eagle in 1997. Two new ferruginous hawk ANSs were constructed in the fall of 1996, and one was used in 1997. Two consistently-unused ferruginous hawk ANSs were moved to new sites in the fall of 1997, and one of these was active in 1998. Previous relocations of ANSs have been described in earlier reports. We plan to build four or five new ANSs and locate them to problem sites in the fall of 1998 for use during the upcoming 1999 nesting season.

There are currently 91 ANSs in the GDRA that are regularly monitored during the nesting season (March thru July). Eighty-one structures were built specifically for ferruginous hawks, nine structures were built specifically for golden eagles, and one structure was built specifically for red-tailed hawks. Of the total available structures, 52 were active in 1998.

Of the 81 ferruginous hawk ANSs, 46 were occupied by ferruginous hawks (38 were successful, producing 102 fledglings, all of which were banded). Eight ferruginous hawk ANSs were active early in the season but for unknown reasons were abandoned. Three of these eight ANSs had a total of 10 unhatched eggs in them. The other five were empty.

TABLE 3A
SUMMARY OF ARTIFICIAL NESTING STRUCTURE USE IN THE GREAT DIVIDE RESOURCE AREA IN 1998

# ANSs Built for FH[1]	# Active FH ANSs	# Successful FH ANSs	# ANSs Failed or Abandoned	# FH ANSs Used By GE/SH[2]	Total # FH ANSs Used
81	46	38	8[3]	1	47

# ANSs Built for GE[4]	# Active GE ANSs	# Successful GE ANSs	# ANSs Failed or Abandoned	# GE ANSs Used By FH	Total # GE ANSs Used
9	2	2	0	2	4

# ANSs Built for RTH[5]	# Active RTH ANSs	# Successful RTH ANSs	# ANSs Failed or Abandoned	# RTH ANSs Used By FH or GE	Total # RTH ANSs Used
1	1	1	0	0	1

[1] Ferruginous hawk artificial nesting structure.
[2] Golden eagle or Swainson's Hawk
[3] Of the 8 FH ANSs that failed or were abandoned, 3 had a total of 10 unhatched eggs in them and the other five had no eggs.
[4] Golden eagle artificial nesting structure.
[5] Red-tailed hawk artificial nesting structure.

Of the nine golden eagle ANSs, two were occupied by golden eagles (production figures are unknown), and two were successfully occupied by ferruginous hawks, producing eight young. The golden eagle ANSs are so high tht none of these eight ferruginous hawk nestlings were banded.

The structure built for red-tailed hawks was active, and a minimum of two young were fledged (as in 1997). These data are summarized in Table 1. Appendix 3A lists the status and production of each ANS for 1998.

Table 3B is an annual comparison of active versus available nests and production from active nests. The number of available ANSs has varied from 31 in 1988 to 91 in 1998. The number of ferruginous hawk pairs that laid eggs on an ANS platform has ranged from 13 in 1988 to 47 in 1997. Annual proportion of laying pairs successful on the structures ranged from a low of 63.6% in 1993 (44 laying pairs and 28 successful laying pairs) to 100% (13 laying pairs and 13 successful laying pairs) in 1988. Productivity ranged from 1.52 (1993) to 3.31 (1988) young fledged per laying pair and 2.30 (1995) to 3.31 (1988) young per successful pair. During the eleven years monitored to date, 403 breeding attempts were recorded from 844 nesting opportunities (47.7%). Of these attempts, 348 (86.3%)

TABLE 3B
YEARLY COMPARISON OF ANS ACTIVITY AND PRODUCTIVITY - 1988 THROUGH 1998

Year	ANSs Available #	# of Laying Pairs (% of available)	# Successful Pairs (% of available)	Total # Fledged	Total # Fledged per Laying Pair	Total # Fledged per Successful Pair
1988	31	13 (41.9)	13 (41.9)	43	3.31	3.31
1989	60	33 (55.0)	30 (50.0)	75	2.27	2.50
1990	71	33 (46.5)	30 (42.3)	82	2.48	2.73
1991	75	37 (49.3)	33 (44.0)	86	2.32	2.61
1992	82	37 (45.1)	35 (42.7)	94	2.54	2.69
1993	83	44 (53.0)	28 (33.7)	67	1.52	2.37
1994	85	33 (38.8)	31 (36.5)	89	2.70	2.87
1995	88	37 (42.0)	30 (34.1)	69	1.86	2.30
1996	88	41 (46.6)	35 (39.8)	92[1]	2.30[1]	2.71[1]
1997	90	49 (52.2)	43 (47.8)	101[2]	2.20[2]	2.40[2]
1998	91	48 (52.7)	40 (44.0)	118	2.46	2.95
TOTAL	844	403 (47.7)	348 (41.2)	916[3]	2.28[3]	2.65[3]

[1] Calculations based on 40 laying pairs and 34 successful pairs because total fledged for one nest was not determined. Ninety-two (92) young relate to 40 attempts to nest and 34 successful nesting attempts.

[2] Calculations based on 46 laying pairs and 43 successful pairs because total fledged for one nest was not determined. One hundred one (101) young relate to 46 attempts to nest and 43 successful nesting attempts.

[3] Calculations based on 401 laying pairs and 346 successful pairs because total fledged for two nests was not determined (one each in 1996 and 1997). Nine hundred sixteen (916) young relate to 401 attempts to nest and 346 successful nesting attempts.

successfully produced 916 young. During the 11 years the ANSs have been monitored, we have observed almost no nesting mortality on ANSs. Only seven young hawks were known to have died after hatching on seven ANSs. Eleven young observed when we checked each nest to determine the age of the nestlings, were not present during the banding phase of the program. Their fates are unknown (these data are from nine of the 11 years of monitoring).

The calculations for average number of ferruginous hawks produced per laying pair and for successful pair (the last two columns in Table 2) have been made on the basis of all available ANSs regardless of whether they were built to accommodate ferruginous hawks or golden eagles. It is much too difficult to separate the data based on whether the young were produced on an ANS designed for ferruginous hawks or golden eagles. Since ferruginous hawks and golden eagles will use either structure, the number of structures available to them is the total number of structures, regardless of which species they were designed for.

Considering that much of this 11-year period has been dryer than normal with relatively low numbers of ground squirrels and rabbits (especially from 1992 through 1995), this production is quite good. In general, production from the ANSs is better than from natural sites because so many natural sites are vulnerable to predation. Many more natural nests are abandoned because they are not secure from predation or other disturbances. The ANSs are very secure and nest abandonment is less frequent than with most natural nests. However, in 1998, the 14 successful natural nests produced 44 young to fledging age, which is 3.14 young per successful nest. This production figure is better than data available for artificial nesting structures for 10 of the last 11 years. A complete history (from 1988 through 1998) of all ANSs, listed by nest number, can be found in Appendix 3B.

APPENDIX 3A

RAPTOR NEST MONITORING
ARTIFICIAL NESTING STRUCTURES
1998

APPENDIX 3A
RAPTOR MONITORING
ARTIFICIAL NESTING STRUCTURES
1998

The information presented in this table is a compilation of the activity status for all ANSs for 1998. Some lines of data, representing an individual nesting structure, appear shaded. These structures had never been used at their original location and were subsequently moved to new locations. There are many dynamic aspects to this project, including the need to move unused artificial nesting structures to new areas to mitigate for conflicts arising from development activity.

Location (By Range)	Nest Status	# of Young	# Banded
Range 78			
AFH24781205 AGE24781201[1]	IA[2]	-	-
AFH24781206	IA	-	-
AFH24782401	IA	-	-
Range 83			
AFH19832002	A[3]	4	4
Range 88			
AFH21880401	IA	-	-
AFH21880601 (Moved in 1993)	-	-	-
AFH21881601 (Moved in 1996)	-	-	-
AFH21881809	A	4	4
AFH22883201	IA	-	-
Range 89			
AFH21890401	A	-	-
AFH21890402	IA	-	-
AFH21890403 (Moved in 1995)	-	-	-
AFH21890603 AGE21890601[1]	IA	-	-
AFH21891001	IA	-	-
AFH21891[illegible]0[illegible]	IA	-	-
AFH21891408	A	-	-
AFH21891801	A	3	3
AFH21892001	IA	-	-
AFH21892002	IA	-	-
AFH21892202	A	2	2

AFH21892604	A	2	2
AFH21893001	A	FAILED	-
AFH22890203 (Moved in 1997)	-	-	-
AFH22891801	A	3	3
AFH22892801	IA	-	-
AFH22893001	IA	-	-
AFH22893201	IA	-	-
AFH22893202 (Moved in 1993)	-	-	-
AFH22893203	IA	-	-
AFH22893412	IA	-	-
AFH22893603	A	FAILED	-
AFH22893604 (Moved in 1991)	-	-	-
AFH22893605	IA	-	-
AFH23892008	IA	-	-
AFH23893206	IA	-	-
AFH23983401 (Moved in 1995)	-	-	-
ART27893401[4]	A	?	-
Range 90			
AFH20900805	A	2	2
AFH21900401	A	3	3
AFH21902001	IA	-	-
AFH21902202	IA	-	-
AFH21902601[5]	A	4	0
AFH21902802	IA	-	-
AFH21903002 AGE21903001[1]	IA	-	-
AFH21903203	A	3	3
ASH26901202	A	FAILED	-
Range 91			
AFH14911201	A	3	3
AFH20910501	A	4	0
AFH21913303	A	1 - Swainson's hawk	0
AFH23910202	A	2	2

AFH23910801	A	3 Eggs	Nest Failure
AFH24910801	A	3	3
AFH24911501	IA	-	-
AFH24913402 (Moved in 1988)	-	-	-
AFH24913403	A	3	3
AFH25912601	IA	-	-
AFH25912802	A	4	4
Range 92			
AGE12920402[5]	IA	-	-
AFH15920503	A	3 Eggs	Nest Failure
AGE15920801[5]	IA	-	-
AFH18921801	A	5	5
AGE18922801	?	5	-
AFH21923002	A	4	3
AFH23920801	A	4	4
AFH24920501	A	2	2
AFH24921801	A	3	-
AFH25921004	IA	-	-
AFH25922802	A	2	2
AFH25923203	A	4 Eggs	Nest Failure
AFH25923302 (Moved in 1994)	-	-	-
AFH25923502	A	2	2
Range 93			
AFH17931002	A	-	-
AFH17931002	A	-	-
AFH17931601	IA	-	-
AGE17933401[5]	A	?	-
AFH18930601	A	4	4
AGE18931601[5,6]	A	4	[illegible]
AFH18932101	IA	-	-
AGE18932701[5]	IA	-	-
AGE18933402 (Moved in 1990)	-	-	-
AFH19933201[7] AGE19933201	IA	-	-

AGE19933302[5,6]	A	4	0
Range 94			
AGE17941802	A	?	2
AGE19942801[5]	?	?	2
AFH21940302 AGE21940301[1]	IA	-	-
AFH21940303	A	4	4
AFH21941202	IA	-	4
AFH21941203	A	2	2
AFH22942304	IA	4	1
AFH22942404	A	4	4
AFH23942001	IA	-	4
AFH23942204	IA	-	1
AFH23942802	A	4	4
Range 95			
AFH23953203	A	2	2
AFH25950202 (Moved in 1992)	-	-	-
AFH25950801	A	2	2
AFH25951201	IA	-	1
AFH25953502	A	1	1
AFH26952901	A	3	3
AFH26953001 (Moved in 1997)	IA	-	-
AFH26953402	A	Nest Abandoned	-
Range 96			
AFH23960602	IA	-	-
AFH23961302	A	4	4
AGE23963402[5]	A	4	4

1. This nest has been identified by two different nest numbers designating ferruginous hawk and golden eagle because at different times both species have used the nest.
2. Inactive
3. Active
4. This nest was installed for a red-tailed hawk rather than a ferruginous hawk. Monitoring indicated that the nest was active, but no intensive effort was made to determine the number of young on the nest.
5. This is either a golden eagle or ferruginous hawk artificial nesting structure, but because it is so high, only an attempt was made to determine the number of young, not to band the ferruginous hawk young.
6. Golden eagle structure occupied by a ferruginous hawk pair in 1998.

APPENDIX 3B

RAPTOR NEST MONITORING
ARTIFICIAL NESTING STRUCTURES
GENERAL ACTIVITY STATUS
1988 - 1998

APPENDIX 3B
FERRUGINOUS HAWK/GOLDEN EAGLE ARTIFICIAL NEST STATUS LOG
GREAT DIVIDE RESOURCE AREA, BUREAU OF LAND MANAGEMENT

GENERAL NEST ACTIVITY STATUS

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	USGS Topo Map	Remarks
AFH24781205/ AGE24781201	-	-	IA	IA	GE 1Y	IA	?	FH 2Y*	IA	IA	Walker Draw SE	
AFH24781206	-	-	IA	IA	IA	IA	?	IA	IA	IA	Walker Draw SE	
AFH24782401	-	-	IA	IA	FH 3Y	FH 3Y	?	IA	IA	IA	Walker Draw SE	
AFH19832002	-	-	-	-	-	IA	FH 2Y*	FH 3Y*	FH 3Y*	FH 3Y*	Overland	
AFH21880401	-	FH 1Y	FH 3Y	FH 2Y	FH 2Y	FH 3Y*	FH 2Y*	FH 3E	IA	IA	Rawlins Peak	
AFH21880601	IA	IA	IA	IA	IA	IA	-	-	-	-	Rawlins Peak SW	Relocated to AFH18921801 on 08/16/93.
AFH21881601	-	IA	IA	IA	IA	IA	IA	IA	IA	-	Rawlins Peak	Relocated to AFH19933201 on 10/16/96.
AFH21881809	FH 4Y	FH 3Y	FH 3Y	FH 3Y	FH 3Y	FH 3Y*	IA	IA	FH 1Y*	FH 1Y*	Rawlins Peak	
AFH22883201	IA	FH 3Y	IA	FH 3Y	FH 3Y	FH 3Y*	?	FAILED	FAILED	IA	Rawlins Peak	
AFH21890401	IA	FH 3Y	FH 2E/1Y	IA	IA	IA	FH 3Y*	IA	IA	FH 3Y*	Rawlins Peak SW	
AFH21890402	IA	IA	IA	FH 2Y	FH 1Y	IA	FH 3Y*	FH 2E	IA	IA	Rawlins Peak SW	
AFH21890403	IA	IA	IA	IA	IA	IA	IA	IA	-	-	Rawlins Peak SW	Reocated to AFH17931002 on 10/16/95.
AFH21890603/ AGE21890601	-	IA	IA	GE 1Y	GE 1Y	IA	IA	IA	IA	IA	Rawlins Peak SW	
AFH21891001	IA	IA	FH 3Y	FH 2Y	FH 3Y	FH 4Y*	?	IA	IA	IA	Rawlins Peak SW	
AFH21891208	IA	FH 2Y	IA	IA	IA	IA	FH 2Y*	IA	IA	IA	Rawlins Peak SW	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg(s); - = Structure not constructed yet/or Structure removed and relocated; ? = Nest not surveyed this year; * = Birds banded; Shaded areas indicate structures which have been removed and relocated to new sites.

APPENDIX 3B (Cont.)
FERRUGINOUS HAWK/GOLDEN EAGLE ARTIFICIAL NEST STATUS LOG
GREAT DIVIDE RESOURCE AREA, BUREAU OF LAND MANAGEMENT

GENERAL NEST ACTIVITY STATUS

BLM Nest Number	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	USGS Topo Map	Remarks
AFH24781205/ AGE24781201	IA										Walker Draw SE	
AFH24781206	IA										Walker Draw SE	
AFH24782401	IA										Walker Draw SE	
AFH19832002	FH 4Y*										Overland	
AFH21880401	IA										Rawlins Peak	
AFH21880601											Rawlins Peak SW	Relocated to AFH18921801 on 08/16/93.
AFH21881601											Rawlins Peak	Relocated to AFH19933201 on 10/16/96.
AFH21881809	FH 4Y*										Rawlins Peak	
AFH22883201	IA										Rawlins Peak	
AFH21890401	FH 3Y*										Rawlins Peak SW	
AFH21890402	IA										Rawlins Peak SW	
AFH21890403											Rawlins Peak SW	Relocated to AFH17931002 on 10/16/95.
AFH21890603/ AGE21890601	IA										Rawlins Peak SW	
AFH21891001	IA										Rawlins Peak SW	
AFH21891208	IA										Rawlins Peak SW	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg(s); - = Structure not constructed yet/or Structure removed and relocated; ? = Nest not surveyed this year; * = Birds banded; Shaded areas indicate structures which have been removed and relocated to new sites.

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	USGS Topo Map	Remarks
AFH21891408	-	-	FH 2Y	FH 3Y	FH 3E	FH 3Y*	IA	IA	AI	FH 1Y*	Rawlins Peak SW	
AFH21891801	-	IA	IA	IA	FH 2Y	FH 2Y*	FH 4Y*	FH 2Y*	FH 3Y*	FH 3Y*	Antelope Spring	
AFH21892001	FH 3Y	IA	IA	FH 3Y	FH 3Y	IA	FH 4Y*	FH 3Y*	IA	IA	Rawlins Peak SW	
AFH21892002	IA	FH 3Y	IA	IA	IA	FH 2Y*	IA	IA	FH 2Y*	FH 3Y*	Rawlins Peak SW	
AFH21892202	IA	FH 3Y	IA	GE 1Y	IA	IA	FH 1Y*	FAILED	IA	FH 1Y*	Rawlins Peak SW	
AFH21892604	-	-	-	-	FH 3Y	FH 1Y*	FH 3Y*	FH 2Y*	IA	FH 3Y*	Antelope Spring	
AFH21893001	-	-	-	-	-	FAILED	FH 4Y*	FH 1Y*	FH 3Y*	FH 2Y*	Antelope spring	Formerly AFH25950202/ Relocated to current site on 10/12/92.
AFH22890203	-	IA	IA	IA	IA	IA	IA	IA	IA	IA	Shamrock Hills	Relocated to AFH21900401 on 10/17/97.
AFH22891801	-	FH 3Y	FH 3Y	FH 3Y	IA	FH 3Y*	FH 2Y*	FH 2Y*	FH 1Y*	FH 2Y*	Rawlins Peak SW	
AFH22892801	-	FH 3Y	FH 3Y	FH 2Y	IA	FH 3Y*	FH 3Y*	FH 1Y*	IA	IA	Rawlins Peak SW	
AFH22893001	-	IA	FH 2Y	IA	FH 2Y	FH 2Y*	FH 3Y*	IA	IA	FH 2Y*	Rawlins Peak SW	
AFH22893201	IA	IA	FAILED	IA	IA	IA	IA	IA	IA	IA	Rawlins Peak SW	
AFH22893202	IA	IA	IA	IA	IA	IA	-	-	-	-	Rawlins Peak SW	Relocated to AFH17931601 on 08/13/93.
AFH22893203	FH 3Y	IA	IA	FH 3Y	IA	IA	IA	IA	IA	IA	Rawlins Peak SW	
AFH22893412	-	FH 3Y	FH 3Y	IA	IA	IA	IA	IA	IA	IA	Rawlins Peak SW	
AFH22893603	IA	IA	IA	IA	IA	FAILED	IA	FH 1Y*	IA	FH 1Y*	Rawlins Peak SW	
AFH22893604	IA	IA	IA	IA	-	-	-	-	-	-	Rawlins Peak SW	Relocated to AFH21923002 on 08/21/91.
AFH22893605	FH 3Y	FAILED	FH 4Y	FH 1Y	FH 4Y	FAILED	IA	IA	IA	IA	Rawlins Peak SW	
AFH23892008	-	IA	IA	GE 1Y FAILED	IA	IA	FH 2Y*	FH 2Y*	FH 3Y*	FH 3Y*	Shamrock Hills	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg(s); - = Structure not constructed yet/or Structure removed and relocated; ? = Nest not surveyed this year; * = Birds banded; Shaded areas indicate structures which have been removed and relocated to new sites.

BLM Nest Number	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	USGS Topo Map	Remarks
AFH21891408	FH 2Y*										Rawlins Peak SW	
AFH21891801	FH 3Y*										Antelope Spring	
AFH21892001	IA										Rawlins Peak SW	
AFH21892002	IA										Rawlins Peak SW	
AFH21892202	FH 2Y*										Rawlins Peak SW	
AFH21892604	FH 2Y*										Antelope Spring	
AFH21893001	FAILED										Antelope spring	Formerly AFH25950202/ Relocated to current site on 10/12/92.
AFH22890203	-										Shamrock Hills	Relocated to AFH21900401 on 10/17/97.
AFH22891801	FH 3Y*										Rawlins Peak SW	
AFH22892801	IA										Rawlins Peak SW	
AFH22893001	IA										Rawlins Peak SW	
AFH22893201	IA										Rawlins Peak SW	
AFH22893202	-										Rawlins Peak SW	Relocated to AFH17931601 on 08/13/93.
AFH22893203	IA										Rawlins Peak SW	
AFH22893412	IA										Rawlins Peak SW	
AFH22893603	FAILED										Rawlins Peak SW	
AFH22893604	-										Rawlins Peak SW	Relocated to AFH21923002 on 08/21/91.
AFH22893605	IA										Rawlins Peak SW	
AFH23892008	IA										Shamrock Hills	

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BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	USGS Topo Map	Remarks
AFH23893206	-	FH 2Y	FH 1Y	FH 1Y	FH 3Y	FAILED	FH 3Y*	FH 2Y*	FH 3Y*	FH 3Y*	Shamrock Hills	
AFH23893401	-	IA	IA	IA	IA	IA	?	IA	-	-	Shamrock Hills	Relocated to AFH17931402 on 10/20/95.
ART27893401	-	-	-	-	-	-	-	RT ?Y	RT ?Y	RT ?Y	Muddy Gap (LRA)	
AFH20900805	-	-	IA	IA	FH 3Y	?	IA	FH 1Y*	FH 4Y*	FH 1Y*	Riner	
AFH21900401	-	-	-	-	-	-	-	-	-	-	Antelope Spring	Formerly AFH2289023. Relocated to current site on 10/17/97.
AFH21902001	-	FH 3Y	FH 3Y	GE 1Y FAILED	GE 1Y FAILED	IA	IA	IA	IA	FAILED	Antelope Spring	
AFH21902202	-	FH 2Y	IA	GE 1Y	GE 1Y	IA	IA	IA	FAILED	IA	Antelope Spring	
AFH21902601	FH 2Y	FH 3Y	FH 3Y	FH 3Y	FH 1Y	IA	IA	FAILED	FH 3Y	GE 1Y	Antelope Spring	Nest too high to band young from.
AFH21902802	-	FH 2Y	FH 2Y	FAILED	IA	FH ?Y	IA	IA	FH 2Y*	FH 2Y*	Antelope Spring	
AFH21903002/ AGE21903001	-	FH 2Y	GE 1Y	FH 3Y	FH 3Y	IA	FH 3Y*	IA	IA	IA	Antelope Spring	
AFH21903203	-	FH 2Y	FH 4Y	FH 3Y	FH 3Y	FH 3Y*	IA	IA	FH 2Y*	FH 2Y*	Antelope Spring	
ASH26901202	-	IA	IA	IA	IA	IA	?	FH 1Y*	IA	FH 2Y*	Bairoil	
AFH14911201	-	-	-	-	FH 3Y	FH 3Y	?	FH 3Y*	FH 4Y*	FH 2Y*	Smiley Draw	
AFH20910501	FH ?Y	?	?	?	?	FH ?Y	?	FH ?Y	FH ?Y	FH ?Y	Creston Junction	Nest too high to band young from.
AFH21903303	-	-	-	FAILED	FH 2Y	FH 1Y*	FH 2Y*	IA	IA	IA	Creston Junction	Used by Swainsons Hawk
AFH23910202	FH 3Y	FH 2Y	FH 4Y	FH 3Y	FH 1Y	FH 1Y	IA	FH 3Y*	IA	FH 4E FAILED	Larsen Knoll	
AFH23910801	FH 5Y	FH 2Y	FH 3Y	FH 3Y	FH 3Y	FAILED	FH 3Y*	FH 2Y*	FH 2Y*	FH 3Y*	Larsen Knoll	
AFH24910801	-	FH 3Y	FH 3Y	IA	FH 2Y	FAILED	FH 2Y*	IA	IA	IA	Chicken Spring	
AFH24911501	FH 3Y	FH 2Y	FH 3Y	FH 3Y	FH 3Y	FAILED	FH ?Y	IA	IA	IA	Chicken Spring	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg(s); - = Structure not constructed yet/or Structure removed and relocated; ? = Nest not surveyed this year; * = Birds banded; Shaded areas indicate structures which have been removed and relocated to new sites.

BLM Nest Number	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	USGS Topo Map	Remarks
AFH23893206	IA										Shamrock Hills	
AFH23893401											Shamrock Hills	Relocated to AFH17931402 on 10/20/95.
ART27893401	RT ?Y										Muddy Gap (LRA)	
AFH20900805	FH 2Y*										Riner	
AFH21900401	FH 3Y*										Antelope Spring	Formerly AFH2289023. Relocated to current site on 10/17/97.
AFH21902001	IA										Antelope Spring	
AFH21902202	IA										Antelope Spring	
AFH21902601	FH 4Y										Antelope Spring	Nest too high to band young from.
AFH21902802	IA										Antelope Spring	
AFH21903002/ AGE21903001	IA										Antelope Spring	
AFH21903203	FH 3Y*										Antelope Spring	
ASH26901202	FAILED										Bairoil	
AFH14911201	FH 3Y*										Smiley Draw	
AFH20910501	FH 4Y?										Creston Junction	Nest too high to band young from.
AFH21903303	SW 1Y										Creston Junction	Used by Swainsons Hawk
AFH23910202	FH 2Y*										Larsen Knoll	
AFH23910801	FH 3E										Larsen Knoll	
AFH24910801	FH 3Y*										Chicken Spring	
AFH24911501	IA										Chicken Spring	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg(s); · = Structure not constructed yet/or Structure removed and relocated; ? = Nest not surveyed this year; * = Birds banded; Shaded areas indicate structures which have been removed and relocated to new sites.

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	USGS Topo Map	Remarks
AFH24913402	IA	-	-	-	-	-	-	-	-		Chicken Spring	Relocated to AFH25923203 on 09/02/88.
AFH24913403	FH 3Y	FH 1Y	FH 3Y	FH 2Y	IA	FH 2Y*	?	IA	IA	FH 1Y*	Chicken Spring	
AFH25912601	-	-	-	FAILED	IA	FH 2Y*	IA	IA	FAILED	IA	Chicken Spring	
AFH25912802	-	FH 3Y	FH 2Y	IA	FH 4Y	IA	?	IA	FH 1Y*	IA	Chicken Spring	
AGE12920402	-	-	-	-	IA	IA	?	IA	GE 1Y	IA	Poison Basin	
AFH15920503	-	-	-	-	IA	?	?	FAILED	FH 3Y*	FH 4Y*	Mexican Flats	
AGE15920801	-	-	-	-	IA	IA	IA	IA	IA	IA	Mexican Flats	
AFH18921801	-	-	-	-	-	-	FH 4Y*	FH 1Y*	FH 4Y*	FH 3Y*	High Point	Rormerly AFH21880601. Relocated to current site on 08/13/93.
AFH21923002	-	-	-	-	IA	FH 2Y*	IA	FH 3Y*	FAILED	FH 3Y*	Ruby Knolls	Formerly AFH22893604. Relocated to current site on 08/22/91.
AFH23920801	-	FH 2Y	FH 3Y	FH 3Y	FH 3Y	FH 1Y*	FH 3Y*	FH 2Y*	FH 3Y*	FH 1Y*	Hansen Lake NE	
AFH24920501	-	IA	FH 4Y	IA	FH 4Y	FH 2Y*	IA	IA	FAILED	FH 3Y*	Sooner Reservoir	
AFH24921801	-	FH Y1	FH 1Y	FH 3Y	FH 3Y	FAILED	IA	FH 2Y*	FH 2Y*	IA	Sooner Reservoir	
AFH25921004	-	-	FH 3Y	FH 1Y	FH 3Y	FAILED	IA	IA	IA	FH 3E FAILED	Osborne Well	
AFH25922802	-	FH 3Y	IA	FH 3E FAILED	FH 1Y	FH ?Y FAILED	IA	IA	FH ?Y FAILED	FH 1E FAILED	Sooner Reservoir	
AFH25923203	-	FH 3Y	FH 1Y	FH 3Y	FH 3Y	FH ?Y FAILED	IA	FH 2E FAILED	IA	FH 3Y*	Sooner Reservoir	Formerly AFH24913402. Relocated to current site on 09/02/88.

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg(s); - = Structure not constructed yet/or Structure removed and relocated; ? = Nest not surveyed this year; * = Birds banded; Shaded areas indicate structures which have been removed and relocated to new sites.

BLM Nest Number	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	USGS Topo Map	Remarks
AFH24913402											Chicken Spring	Relocated to AFH25923203 on 09/02/88.
AFH24913403	FH 3Y*										Chicken Spring	
AFH25912601	IA										Chicken Spring	
AFH25912802	FH 4Y*										Chicken Spring	
AGE12920402	IA										Poison Basin	
AFH15920503	FH 3E FAILED										Mexican Flats	
AGE15920801	IA										Mexican Flats	
AFH18921801	FH 5Y*										High Point	Rormerly AFH21880601. Relocated to current site on 08/13/93.
AFH21923002	FH 3Y*										Ruby Knolls	Formerly AFH22893604. Relocated to current site on 08/22/91.
AFH23920801	FH 4Y*										Hansen Lake NE	
AFH24920501	FH 2Y*										Sooner Reservoir	
AFH24921801	FH 3Y*										Sooner Reservoir	
AFH25921004	IA										Osborne Well	
AFH25922802	FH 2Y*										Sooner Reservoir	
AFH25923203	FH 4E FAILED										Sooner Reservoir	Formerly AFH24913402. Relocated to current site on 09/02/88.

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg(s); - = Structure not constructed yet/or Structure removed and relocated; ? = Nest not surveyed this year; * = Birds banded; Shaded areas indicate structures which have been removed and relocated to new sites.

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	USGS Topo Map	Remarks
AFH25923302	-	IA	IA	IA	IA	IA	IA	-	-	-	Sooner Reservoir	Relocated to AFH23942802 on 10/13/94.
AFH25923502	-	-	-	FH 3Y	FH 2Y	FAIED	IA	IA	IA	IA	Sooner Reservoir	
AFH17931002	-	-	-	-	-	-	-	-	FH 3Y*	FH 4Y*	Duck Lake	Formerly AFH21890403. Relocated to current site on 10/16/95.
AFH17931402	-	-	-	-	-	-	-	-	FH 3Y*	IA	Duck Lake	Formerly AFH23893401. Relocated to current site on 10/20/96.
AFH17931601	-	-	-	-	-	-	FH 4Y*	FH 4Y*	FH 2Y*	FH 3Y*	Duck Lake	Formerly AFH22893202. Relocated to current site on 08/16/93.
AGE17933401	-	-	-	-	IA	IA	IA	IA	GE ?Y	GE ?Y	Duck Lake	
AFH18930601	-	-	-	-	-	-	-	FH 4Y*	FH 2Y*	FH 3Y*	Eight Mile Lake	
AGE18931601	FH 3Y	GE 2Y	GE 1-2Y	?	IA	IA	IA	FH ?Y	FH 2Y	FH 2Y	Eight Mile Lake	Nest too high to band from.
AFH18932101	-	-	IA	FH 1Y	FH 2Y	FH 3Y	FH 3Y*	IA	IA	IA	Eight Mile Lake	
AGE18932701	-	-	IA	GE ?Y	GE 1Y	IA	IA	IA	FH ?Y	GE ?Y	High Point	Formerly AGE18933402. Relocated to current site on 03/13/90.
AGE18933402	IA	IA	-	-	-	-	-	-	-	-	Duck Lake	Relocated to AGE18932701 on 03/13/90.
AFH19933201/ AGE19933201	-	-	-	-	-	-	-	-	-	GE ?Y	Eight Mile Lake	Formerly AFH21881601. Relocated to current site on 10/16/96.

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg(s); - = Structure not constructed yet/or Structure removed and relocated; ? = Nest not surveyed this year; * = Birds banded; Shaded areas indicate structures which have been removed and relocated to new sites.

BLM Nest Number	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	USGS Topo Map	Remarks
AFH25923302	-										Sooner Reservoir	Relocated to AFH23942802 on 10/13/94.
AFH25923502	FH 2Y*										Sooner Reservoir	
AFH17931002	FH 3Y*										Duck Lake	Formerly AFH21890403. Relocated to current site on 10/16/95.
AFH17931402	FH 3Y*										Duck Lake	Formerly AFH23893401. Relocated to current site on 10/20/96.
AFH17931601	IA										Duck Lake	Formerly AFH22893202. Relocated to current site on 08/16/93.
AGE17933401	GE ?Y										Duck Lake	
AFH18930601	FH 4Y*										Eight Mile Lake	
AGE18931601	FH 4Y										Eight Mile Lake	Nest too high to band from.
AFH18932101	IA										Eight Mile Lake	
AGE18932701	IA										High Point	Formerly AGE18933402. Relocated to current site on 03/13/90.
AGE18933402	-										Duck Lake	Relocated to AGE18932701 on 03/13/90.
AFH19933201/ AGE19933201	IA										Eight Mile Lake	Formerly AFH21881601. Relocated to current site on 10/16/96.

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg(s); - = Structure not constructed yet/or Structure removed and relocated; ? = Nest not surveyed this year; * = Birds banded; Shaded areas indicate structures which have been removed and relocated to new sites.

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	USGS Topo Map	Remarks
AGE19933302	-	-	IA	GE Y?	AI	2Y	AI	AI	AI	FH ?Y	Eight Mile Lake	Nest too high to band young from.
AGE17941802	-	-	-	-	IA	IA	IA	?	?	GE 1Y	Barrel Springs	
AGE19942801	-	-	-	FAILED	IA	IA	IA	?	IA	GE 1Y	Eight Mile Lake	
AFH21940302/ AGE21940301	IA	GE 1Y	IA	?	GE 1Y	IA	IA	FH 4Y*	IA	IA	Dennison Cap	
AFH21940303	IA	IA	GE 2Y	?	IA	IA	IA	IA	FH 4Y*	FH 3Y*	Dennison Cap	
AFH21941202	-	-	-	-	-	-	-	-	-	IA	Monument Lake	
AFH21941203	-	-	-	-	-	-	-	-	-	FH 3Y*	Monument Lake	
AFH22942304	-	-	IA	FH 3Y	IA	IA	IA	IA	IA	IA	Dennison Cap	
AFH22942404	-	FAILED	FH 2Y	IA	FH 4Y	FH 3Y*	FH 4Y*	FH 3Y*	FH 4Y*	FH 3Y*	Monument Lake	
AFH23942001	-	-	-	-	-	-	-	-	-	-	Lost Creek Butte	Formerly AFH26953001. Relcated to current site on 10/30/97.
AFH23942204	-	-	FH 2E FAILED	FH 3Y	FH 3Y	FAILED	FH 3Y*	IA	FH 3Y*	IA	Lost Creek Butte	
AFH23942802	-	-	-	-	-	-	-	FH 4Y*	FH 4Y*	FH 3Y*	Lost Creek Butte	Formerly AFH25923502. Relocated to current site on 10/13/94.
AFH23953203	-	IA	FH 2Y	FH 3Y	IA	FH 4Y*	FH 4Y*	FH 3Y*	FH 4Y*	FH 4Y*	Lost Creek Butte	
AFH25950202	FH 3Y	IA	IA	IA	IA	-	-	-	-	-	Cyclone Draw	Relocated to AFH23001 on 10/2/92.
AFH25950801	FH 4Y	FH 3Y	FH 3Y	FH 3Y	FH 2E FAILED	FH 2Y*	FH 3Y*	FH 2Y*	FH 2Y*	FH 2Y*	Cyclone Draw	
AFH25951201	FH 4Y	FAILED	IA	FH 1Y	FH 3Y	FH 4E FAILED	FAILED	IA	FH 1Y*	FH 3Y*	Osborne Draw	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg(s); - = Structure not constructed yet/or Structure removed and relocated; ? = Nest not surveyed this year; * = Birds banded; Shaded areas indicate structures which have been removed and relocated to new sites.

BLM Nest Number	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	USGS Topo Map	Remarks
AGE19933302	FH 4Y										Eight Mile Lake	Nest too high to band young from.
AGE17941802	GE ?Y										Barrel Springs	
AGE19942801	?										Eight Mile Lake	
AFH21940302/ AGE21940301	IA										Dennison Cap	
AFH21940303	FH 4Y*										Dennison Cap	
AFH21941202	IA										Monument Lake	
AFH21941203	FH 2Y*										Monument Lake	
AFH22942304	IA										Dennison Cap	
AFH22942404	FH 4Y*										Monument Lake	
AFH23942001	IA										Lost Creek Butte	Formerly AFH26953001. Relcated to current site on 10/30/97.
AFH23942204	IA										Lost Creek Butte	
AFH23942802	FH 4Y*										Lost Creek Butte	Formerly AFH25923502. Relocated to current site on 10/13/94.
AFH23953203	FH 2Y*										Lost Creek Butte	
AFH25950202	-										Cyclone Draw	Relocated to AFH23001 on 10/2/92.
AFH25950801	FH 2Y*										Cyclone Draw	
AFH25951201	IA										Osborne Draw	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg(s); - = Structure not constructed yet/or Structure removed and relocated; ? = Nest not surveyed this year; * = Birds banded; Shaded areas indicate structures which have been removed and relocated to new sites.

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	USGS Topo Map	Remarks
AFH25953502	IA	FH 4Y	FH 3Y	FH 4Y	FH 3Y	FH 1Y*	FH 1E FAILED	FH 3Y*	IA	FH 1Y*	Lost Creek Lake	
AFH26952901	-	-	-	-	-	-	FH 3Y*	FH 3Y*	FH 3Y*	FH 3Y*	Cyclone Draw	
AFH26953001	-	-	-	-	-	-	IA	IA	IA	IA	Cyclone Draw	Relcated to FH23942001 on 10/30/97.
AFH26953402	IA	FH 3Y	IA	FH Y3	?	FAILED	FH 3Y*	IA	FH 2Y*	FH 2Y*	Cyclone Draw	
AFH23960602	-	-	-	-	-	-	-	IA	IA	IA	Red Lake NW	
AFH23961302	-	-	FH 3Y	FH 4Y	IA	FH 5Y*	FH 4Y	IA	FH 4Y*	FH 2Y*	Lost Creek Butte NW	
AGE23963402	-	IA	GE 2Y	GE ?Y	IA	FAILED	IA	IA	GE 1Y	GE ?Y	Red Lake NE	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg(s); - = Structure not constructed yet/or Structure removed and relocated; ? = Nest not surveyed this year; * = Birds banded; Shaded areas indicate structures which have been removed and relocated to new sites.

BLM Nest Number	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	USGS Topo Map	Remarks
AFH25953502	FH 1Y*										Lost Creek Lake	
AFH26952901	FH 3Y*										Cyclone Draw	
AFH26953001	-										Cyclone Draw	Relcated to FH23942001 on 10/30/97.
AFH26953402	FAILED										Cyclone Draw	
AFH23960602	IA										Red Lake NW	
AFH23961302	FH 4Y*										Lost Creek Butte NW	
AGE23963402	IA										Red Lake NE	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg(s); - = Structure not constructed yet/or Structure removed and relocated; ? = Nest not surveyed this year; * = Birds banded; Shaded areas indicate structures which have been removed and relocated to new sites.

Part 4

FERRUGINOUS HAWK BANDING PROJECT UPDATE
1993 - 1998

The GDRA has been banding nestling ferruginous hawks annually since 1993. All known active ferruginous hawk nests, both natural and artificial structures, are intensively monitored to determine the number of young and the ages of the young. This process allows me to schedule banding dates for each nest when the young are approximately 32 to 38 days old. This, I feel, is the ideal time to band nestlings because their legs are about as large as they will get, so sizing bands can be most accurate. When approached slowly and quietly, most birds are very easy to handle even at this age. Birds from all ANSs, and birds from as many natural nests that we can locate and access are banded every year.

The Shamrock Hills ACEC is more intensively monitored; the study plan for this area is included in this report as Appendix 4A. This section will summarize this years banding program and the data collected for the first six years of the banding project. Appendix 4D is a photo log of almost all of the active nests from which ferruginous hawk nestlings were banded in 1998.

When a bird is banded, a number of measurements are taken. Two measurements are taken of the bird's tarsus (lower leg), a narrow width and a wide width. The length of the tarsus is also measured. The length of the sixth primary feather on the right wing and the length of the sixth tail feather from the right side of the body are recorded. The bird is weighed, its age estimated, and both its legs are banded. A United States Fish and Wildlife Service (USFWS) aluminum band is placed on one leg, and a colored band is placed on the other leg. For 1996 through 1998, the following band placement guidelines apply:

Banding Strategy Within the Shamrock Hills Study Area

Natural Nests:	**USFWS** aluminum bands on the **left** leg **Green** plastic bands on the **right** leg
Artificial Nests:	**USFWS** aluminum bands on the **left** leg **Red** plastic bands on the **right** leg

Banding Strategy Outside the Shamrock Hills Study Area

Natural Nests:	**USFWS** aluminum bands on the **left** leg **White** plastic bands on the **right** leg
Artificial Nests:	**USFWS** aluminum bands on the **right** leg; **White** plastic bands on the **left** leg.

This banding scheme will be changed for the 1999-2001 banding period, for the 2002-2004 period, and again for the 2005-2007 banding period. The purpose of changing the banding scheme on a three-year schedule is to determine whether the three objectives identified in the study plan (Appendix B) are being met.

This year, 141 ferruginous hawk nestlings were banded. This is the largest number of nestlings banded since the project began in 1993. The first birds were banded on June 13, 1997, and the last were banded on July 8, 1997. Thirty-nine birds were banded from natural nests and 102 were banded from ANSs. Table 4A summarizes the number of ferruginous hawks banded since the banding study began in 1993.

TABLE 4A
FERRUGINOUS HAWK NESTLINGS BANDED BY YEAR
1993 - 1998

Year	# Banded	Date 1st Bird Banded	Date Last Bird Banded
1993	78	06-22-93	07-07-93
1994	102	06-20-94	07-15-94
1995	86	06-15-95	07-05-95
1996	117	06-14-96	07-19-96
1997	117	06-13-97	07-08-97
1998	141	06-19-98	07-08-98

Over the past six years, 641 ferruginous hawk nestlings have been banded. Banding data over this same period has produced some interesting information. Using the estimated ages of birds when banded, their hatching dates can be calculated. Using an estimated 32-day incubation period, the egg-laying date can also be determined.

Between 1993 and 1998, the estimated egg-laying dates ranged from early April to the middle of May. Table 4B lists the range of egg-laying and egg-hatching dates estimated from the ages of young, banded birds for each year.

TABLE 4B
ESTIMATED BEGINNING AND ENDING EGG-LAYING/HATCHING DATES
FERRUGINOUS HAWK NESTLINGS 1993 THROUGH 1998

Year	Estimated First and Last Egg-Laying Dates	Estimated First and Last Egg-Hatching Dates
1993	April 09 - May 06	May 11 - June 07
1994	April 08 - May 12	May 10 - June 13
1995	April 04 - May 04	May 06 - June 05
1996	April 07 - May 14	May 09 - June 15
1997	April 07 - May 14	May 06 - June 08
1997	April 09 - May 05	May 11 - June 06

Table 4C is a summary of average egg-laying and egg-hatching dates for the five years of banding data, 1993 through 1997. Egg-laying and egg-hatching dates exhibit a normal distribution with some dates very early in the season, some very late, and the majority clustered in the center of the season. For the first three years of the study and in 1998, the eggs were laid during the two-week period between April 14 and April 27 and hatched between May 16 and May 29 for over 75% of all young banded.

In 1996, however, the same two 14-day periods of April 14-April 27 and May 16-May 29, produced only 68% of all eggs laid/hatched. For the same two-week periods in 1997, the percentage of the total number of eggs laid/hatched drops to 56%. Then in 1998, the grouping of egg-laying and egg-hatching dates returned to probably the most "normal" distribution seen since the study began. It is difficult to determine why the 1996 and 1997 percentages are so far below the 1993-1995 averages, but weather conditions, human disturbances, prey base abundance, individual pair behavior, and probably many other factors play a role. For whatever reason(s), the overall length of the egg-laying/egg-hatching periods for 1997 or 1998 were not appreciably different from the egg-laying/egg hatching periods of any of the previous years (See Table 4C), but the distribution of egg-laying and egg-hatching dates is spread more evenly throughout the 1997 nesting season than in any of the previous four years. Appendix 4C depicts graphically the distribution of egg-laying and egg-hatching dates for all years individually and in combination.

The standard stipulation dates for raptor nesting used for oil and gas and other surface disturbance activities extend from February 1 through July 31. These dates are set to include the nesting periods for any and all raptors which might be encountered. The important period for ferruginous hawks is March 1 through July 31. In essence, the month of March is when the birds return to the summer range for nesting. Courtship and nest building activities occupy the birds during this time period. Egg-laying and incubation engage the birds during April and May. Hatching and brood-rearing activities keep the adults busy in May and June, and the month of July, in general, involves fledging of the young. During this last period, the young tend to stay close to the nest, practice flying, continue to be fed by the adults, and learn to hunt for themselves. The egg-laying, incubation, and egg-hatching data reinforce the need to maintain the standard stipulation dates for the protection of nesting ferruginous hawks.

TABLE 4C
PRIMARY EGG LAYING AND EGG HATCHING DATES FOR FERRUGINOUS HAWK NESTLINGS
1993-1998

Year (# Birds w/Estimated Ages)[1]	Based on Primary Egg-Laying Period of April 14-April 27: Prior to April 14 #	(%)	April 14-April 27 #	(%)	After April 27 #	(%)	Based on Primary Egg-Hatching Period of May 16-May 29: Prior to May 16 #	(%)	May 16-May 29 #	(%)	After May 29 #	(%)
1993 (76)	3	4%	67	88%	6	8%	3	4%	67	88%	6	8%
1994 (100)	14	14%	79	79%	7	7%	14	14%	79	79%	7	7%
1995 (86)	9	10%	71	83%	6	7%	9	10%	71	83%	6	7%
1996 (117)	31	27%	80	68%	6	5%	31	27%	80	68%	6	5%
1997 (117)	32	27%	65	56%	20	17%	32	27%	65	56%	20	17%
1998 (141)	9	6%	124	88%	8	6%	9	6%	124	88%	8	6%

[1] In 1993, 78 young birds were banded, but age estimates were only made for 76; in 1994, 102 young birds were banded, but age estimates were only made for 100; in 1995, 1996, 1997, and 1998, age estimates were made for all banded birds.

Other interesting data have been recorded while conducting the banding study. Tables 4D illustrates the distribution of the numbers of young produced in ANSs as well as in natural nesting sites. The data conform to a normal distribution, with a few nests (in most years) containing only one young, and only very infrequent nests which contain five young. Most nests contain from two to four young, with three being the most common. This situation holds true for both ANSs and natural nests, as would be expected.

TABLE 4D

DISTRIBUTION OF NESTS WITH 1 TO 5 YOUNG PRODUCED BOTH ON ANSs AND NATURAL NESTS FOR YEARS 1993 THROUGH 1998 (Includes Banded and Unbanded Nestlings)

	Artificial Nesting Structure					Natural Nest Site				
Year	1 Young	2 Young	3 Young	4 Young	5 Young	1 Young	2 Young	3 Young	4 Young	5 Young
1993	5	8	8	2	1	0	4	4	0	0
1994	1	7	13	7	1	0	1	5	1	0
1995	7	9	9	4	0	0	3	3	1	0
1996	3	10	11[1]	8	0	0	2	6	2	0
1997	7	9[2]	23[3]	3	0	1	1	5	0	0
1998	1	12	12[3]	13	1	1	2	5	6	0

[1] One of these nests produced 3 young but when we returned to band the nestlings, one was dead on the ground next to the ANS.

[2] One of these nests produced 2 young but when we returned to band the nestlings, one was dead on the ground next to the ANS.

[3] One of these nests produced 3 young but when we returned to band the nestlings, one was missing, It's fate was unknown.

Table 4E shows by year where ferruginous hawks have chosen to nest. By far, the most "popular" nesting site is the ANS. However, as has been reported in many other studies of ferruginous hawks, these birds will use a large variety of nesting substrate, from several types of trees, to windmills, rock outcrops, and other man-made features. While the birds tend to avoid areas of human habitation, they do not necessarily avoid man made features on the landscape. Ferruginous hawks successfully produced young from 14 natural nesting sites in 1998. Although this number is 40% higher than what was recorded in any previous year (10 successful natural nests in 1996), it should be remembered that much more ferruginous hawk habitat was monitored in 1998 than in any year shown. It is entirely likely that nesting success was higher in previous years, but we were unable to monitor the area as fully.

TABLE 4E

DISTRIBUTION OF FERRUGINOUS HAWK NESTS BASED ON TYPE OF NESTING SUBSTRATE ANS OR NATURAL

	Artificial Nesting Structures		Natural Nests							
Year	Ferrug. Hawk ANS	Golden Eagle ANS	Cotton-wood Tree	Juniper Tree	Limber Pine Tree	Well-House Windmill	Rock Outcrop Pillar	Power Pole	Conden-sation Tank	Gas Well Facility Building
1993	24	0	0	1	0	1	4	0	2	0
1994	29	0	0	0	0	1	4	0	2	0
1995	29	0	1	1	0	1	3	0	1	0
1996	32	0	1	1	0	1	5	0	2	0
1997	42	0	1	0	0	0	3	0	3	0
1998	38	2	1	1	1	2	3	1	4	1

Band Recovery Information

In the past five years we have received recovery information on three young ferruginous hawks banded in the GDRA. There have been no recoveries in the past year, so this information is identical to what was reported last year. The recovery information is as follows:

	Band Number	Date Banded	Date Recovered	Location Found	Condition of Young When Found
1.	1207-63112	06-25-93	02-27-94	Rio Grand River, Texas	Found dead.
2.	0608-01286	06-27-93	04-12-94	Sheridan, Wyoming	?, only the band # was reported
3.	0788-26207	06-26-95	08-15-95	Leech Lake Res., Minnesota	Found injured; died 1 day later

The first two birds were banded under the Wyoming Cooperative Fish and Wildlife Research Unit's banding permit. These two birds were banded by Loren Ayres from natural nests in the area west of Baggs, Wyoming. The third bird was banded by Larry Apple from an ANS located northwest of Rawlins, Wyoming.

PREY BASE OBSERVATIONS

Since the inception of the banding project, there have been no attempts to evaluate prey base abundance in the Shamrock Hills ACEC nor in any other part of the GDRA. We have, however, kept a record of every prey item encountered within or below every active ANS or natural nest monitored. Out of a total of 112 prey items recorded in 73 nests from 1993 through 1998 a total of 79 Wyoming ground squirrels were found. Three 13-lined ground squirrels have been observed in nests, along with the remains of eight cottontail rabbits (most rabbits are young of the year, not adults). Five unidentified voles were observed, along with one prairie vole. A least chipmunk was noted in one nest and one western harvest mouse was found in another nest in 1998. In addition, one unidentified small mammal was also found. Five unidentified songbirds and one horned lark were counted. On only one occasion has the remains of a sage grouse been noted, but on one other occasion, a sage grouse was reported to have been dropped by an adult returning to its nest. This report came from an oil field worker and was not checked nor substantiated. Also, prairie dog remains have been found in ferruginous hawk nests on two occasions (not during the nesting season), and three prairie dog remains were found in 1998.

It is apparent that Wyoming ground squirrels are the predominant item in the diet of ferruginous hawks in southcentral Wyoming. The data also suggest that sage grouse do not commonly fall prey to ferruginous hawks. This may be because they are larger than the prey ferruginous hawks in this area prefer to pursue. Regardless of the reason, I would suggest that sage grouse populations are not in danger from predation by ferruginous hawks. A complete listing of prey items recorded in conjunction with raptor surveys can be found in Appendix 4C.

FUTURE MONITORING PLANS

Monitoring natural and artificial nesting structures will hopefully continue in 1999. This is necessary both in order to respond to oil and gas exception requests and other proposals for surface disturbing activities and to determine which nests and structures are active so that a banding schedule can be developed.

In addition to the normal monitoring, a minimum of two volunteers will be recruited to intensively monitor the Shamrock Hills study area and other areas impacted by development activities. The volunteers will monitor all structures and natural nests within the Shamrock Hills study area looking for colored leg bands on birds establishing territories, building nests, or otherwise occupying the area. Any other volunteers will monitor other known nests, add new nests to the inventory, and delete nests which are found to no longer exist. These data will be used to meet the study plan objectives (described in Appendix 4A) and help to update the raptor inventory. We hope to recruit volunteers through the American Birding Association, HawkWatch International, and any other available sources.

However, there is a question at this point of whether we will pursue volunteers again in 1999 or try to hire seasonal employees. There are valid arguments on either side. Some of the main reasons to seek seasonal employees over volunteers are 1) more qualifying experience, 2) more maturity, and 3) more likelihood of returning in subsequent years. The main problem is that seasonal employees cost more and our budgets are declining. If we do hire seasonal employees, it is rather unlikely that the budget will allow for more than one or two individuals. In 1998 we had six volunteers, and they worked fulltime over a three to four months period to cover the areas assigned to them. One or two seasonals will not be able to inventory or monitor as much territory.

We hope to continue monitoring all ANSs and as many natural nests as time, priority, budget, and volunteer/seasonal assistance will allow in 1999

APPENDIX 4A

FERRUGINOUS HAWK BANDING STUDY

FERRUGINOUS HAWK BANDING STUDY

U.S. Department of the Interior
Bureau of Land Management
Great Divide Resource Area
Rawlins, Wyoming 82301

Introduction

The breeding range of the ferruginous hawk (*Buteo regalis*) extends roughly from southern Manitoba through the Dakotas and southward to Texas, then westward to northern New Mexico and Arizona and northward through eastern Oregon and Washington and the prairie provinces of Alberta and Saskatchewan (Call 1994). Wyoming is the approximate center of the hawks' breeding range and has one of the largest nesting populations of any state or province. The Shamrock Hills, located approximately 13 kilometers (8 miles) west of Rawlins, has one of the highest known nesting populations of these birds within Wyoming.

The ferruginous hawk was listed under the Endangered Species Act as a Category 2 species by the U.S. Fish & Wildlife Service (USFWS). This means that data currently available to the USFWS indicate that listing the species as threatened or endangered may be appropriate, but that persuasive data on biological vulnerability and threat are not currently available. The USFWS has suspended the use of Category 2 and 3 designations and now classifies the ferruginous hawk as a "species at risk". BLM intends to continue to manage actions in ferruginous hawk habitat such that the hawk will not need to be designated either threatened or endangered in the future.

Ferruginous hawks are thought to be the least numerous of all North American buteos, or broad-winged, soaring hawks (Olendorff 1993). Other common buteos include the red-tailed hawk (*Buteo jamaicensis*), which numbers in the hundreds of thousands, and Swainson's hawk (*Buteo swainsoni*), which numbers about thirty thousand. The total number of ferruginous hawks has been estimated at not more than 10,000 to 15,000 birds (Call 1985 and 1988; Schmutz 1987; U.S. FWS 1992; and Olendorff 1993).

Since the early 1980s, there has been a steady decline in the estimated population throughout the entire range of the species, and population fluctuations have been observed as well in the Great Divide Resource Area. There may be several reasons for the decline. The area has experienced severe to moderate drought conditions since 1987 (U.S. BLM 1995a), gradually reducing the overall forage production within the area. This situation has resulted in what Great Divide Resource Area biologists believe are generally lower population levels of the main prey species, the Wyoming ground squirrel (*Spermophilus elegans*). Steady increases in human-related development activity throughout the region of southcentral Wyoming are also likely a factor in the population decline.

During the same period two companies have attempted to develop commercially viable coal gasification projects within the Shamrock Hills Study Area (SHSA). This has involved development of a central plant site, the drilling of delineation, injection and recovery wells, and other surface disturbing activities. Full-scale operation of the project would have affected 36,500 acres of ferruginous hawk habitat in the SHSA. Although neither project proceeded from the demonstration phase into commercial production, current technology is suitable for a similar project to be successful. Another company will very likely attempt to develop this coal resource in the future.

The scope of the proposed coal gasification project would have directly affected many natural ferruginous hawk nesting sites. Some natural nest sites would have been destroyed by the development of the project, others would have been abandoned, and others would have failed because of the proximity of construction or maintenance activity. Consequently, thirty (30) artificial nesting structures (ANSs) were assembled and located at sites around the Shamrock Hills Study Area where they would hopefully not be disturbed by development activity. The ANSs were intended to be mitigation for disturbance, in anticipation of full-scale operation of the gasificaiton project.

There are no oil and gas leases within the SHSA, and the potential for oil and gas development is small. Livestock grazing (cattle) currently occurs within the SHSA and is not considered to impact ferruginous hawk nesting.

By banding young birds, and monitoring (as described in the Methods and Monitoring Stratety sections of this study plan), we hope to be able to determine long-term recruitment rates, population density for the SHSA, long-term productivity rates, and longevity of the birds in the population. This information is important to help determine long-term ferruginous hawk population dynamics and the impacts development might have on the population. In the absence of immediate development these data will help establish a baseline from which future development impacts can be determined.

Goals and Objectives

Goal: Document ferruginous hawk population dynamics in the SHSA.

Objectives:

A. Determine recruitment to the breeding population in the Shamrock Hills Study Area (SHSA) from birds born to the population and from external sources.

B. Determine fidelity of adults to natural nest sites and artificial nesting structures, and longevity of adults in the study area (fidelity to structures and turnover in the adult population).

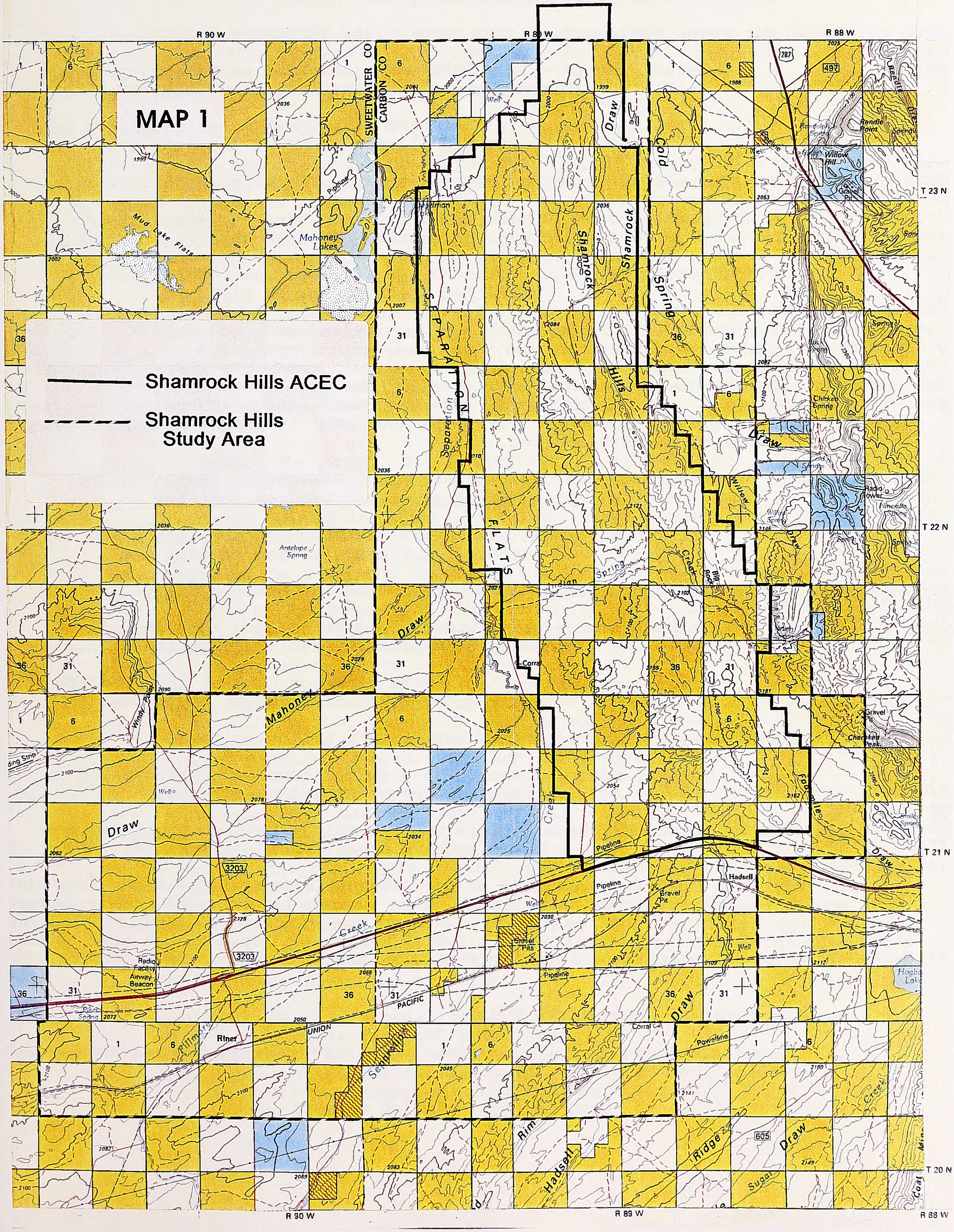
C. Determine long-term ferruginous hawk productivity rates in the SHSA.

Study Area

The Shamrock Hills study area is located approximately 13 kilometers (8 miles) west of Rawlins, Wyoming and includes parts of Townships 20, 21, and 22 North, and Ranges 88, 89, and 90 West. The study area includes all of the Shamrock Hills Area of Critical Environmental Concern (ACEC) and additional ferruginous nesting/hunting habitat both east and west of the ACEC (Map 1). The study area is entirely within an area of "checkerboard" ownership and consists of roughly 50% public and 50% privately owned lands. Separation Creek, an intermittent stream, is the principal drainage within the study area. Table 1 is a listing of all sections, by township and range, that are in the SHSA.

Table 1. Legal Descriptions of lands within the Shamrock Hills Study Area

Township and Range	Sections
T.20N., R.89W.	3,4,5,6,7,8,9,10
T.20N., R.90W.	1,2,3,4,5,6,7,8,9,10,11,12
T.20N., R.91W.	1,2,11,12
T.21N., R.88W.	4,5,6,7,8,9,16,17,18
T.21N., R.89W.	All Sections
T.21N., R.90W.	7 - 36
T.22N., R.88W.	6,7,18,19,30,31
T.22N., R.89W.	All Sections
T.23N., R.89W.	2 - 11, 14 - 23, 26 - 35


MAP 1
Shamrock Hills ACEC
Shamrock Hills Study Area
R 90 W
R 89 W
R 88 W
T 23 N
T 22 N
T 21 N
T 20 N
SWEETWATER CO
CARBON CO
Mud Lake Flats
Mahoney Lakes
SEPARATION FLATS
Separation
Shamrock
Shamrock Hills
Cold Spring
Draw
Willow
Chicken Spring
Radio Tower
Antelope Spring
Indian Spring
Big Rock
Corral
Mahoney
Windy Point
Hadsell
Pipeline
Gravel Pit
Gravel Pits
Radio Facility Airway Beacon
Piper Spring
Riner
UNION PACIFIC
Pillmore
Creek
Powerline
Rim
Hadsell
Ridge
Sugar Draw
Rendle Point
Randolph Spring
Willow Hill
Cherokee Peak
287
497
3203
605

Methods

A. Banding Strategy Within Bounded Study Area

1. Band *all* known ferruginous hawk nestlings within the bounded study area, from both natural and artificial nests.

2. For years *1993* through *1995* band in the following manner:

    a. Natural nests: place USFWS aluminum band on right leg and place green plastic bands on the left leg

    b. Artificial nests: place USFWS aluminum band on right leg and place red plastic bands on the left leg

3. For years *1996* through *1998* band in the following manner:

    a. Natural nests: place USFWS aluminum band on left leg and place green plastic bands on the right leg

    b. Artificial nests: place USFWS aluminum band on left leg and place red plastic band on right leg

4. For years *1999* through *2001* request authorization from USFWS through a permit amendment to use four new colors (colors a, b, c, and d). Reserve two of the new colors for use in the years 2005 through 2007. Select the two colors to be used for the next six years. These will be used to continue the study and avoid confusion with the red and green used during the first six years and help to determine age class of birds observed/recovered.

    a. Natural nests: place USFWS aluminum band on right leg and place color a plastic band on left leg

    b. Artificial nests: place USFWS aluminum band on right leg and place color b plastic band on left leg

5. For years *2002* through *2004* band in the following manner:

    a. Natural nests: place USFWS aluminum band on left leg and place color a plastic band on right leg

    b. Artificial nests: place USFWS aluminum band on left leg and place color b plastic band on right leg

6. For years *2005* through *2007* band in the following manner:

    a. Natural nests: place USFWS aluminum band on right leg and place color c plastic band on left leg

    b. Artificial nests: place USFWS aluminum band on right leg and place color d plastic band on left leg

This strategy will allow documentation of recruitment rates of individuals into the local population. Ferruginous hawks attain adult plumage by the end of their second year but may not breed that year. By changing the configuration of banding on three-year intervals for natural and artificial nests, BLM hopes to get some useful information about recruitment into local populations and data on longevity of the adult birds.

B. Banding Strategy Outside the SHSA

1. Band all known ferruginous hawk nestlings outside the bounded study area, from both natural and artificial nests.

2. For all years, band in the following manner:

a. Natural nests: place USFWS aluminum band on left leg and
place white plastic band on right leg

b. Artificial nests: place USFWS aluminum band on left leg and
place white plastic band on right leg

Birds outside the bounded study area will be banded in hopes of obtaining some additional migration/location information resulting from band recoveries. Observational data of these banded birds within the SHSA will also provide information on immigration of birds from outside the SHSA to within the SHSA.

C. Monitoring Strategy

This is the most important aspect of the study since nearly all results/data will be obtained in this phase. Observations of all active nests within the bounded area with enough intensity to determine whether the adults have red or green bands on either the left or right leg is essential. The monitoring must also collect enough other data to meet the objectives of the project (see Reporting Requirements Section). BLM must ensure that serious and dedicated monitoring is the hallmark of this study.

During the monitoring process, every nest within the SHSA will need to be monitored. Activity status, nesting phenology, productivity, and nest and nest site reoccupancy are just a few of the data elements needed. A nesting chronology must be documented for all active, abandoned, and reoccupied nests. The data elements shown on the attached sample data sheet are the minimum data needed to achieve the goals and objectives of the study. The following actions need to be taken to accomplish the study objectives:

1. Enlist the help of dedicated volunteers for the months of April/May/June to closely monitor all active nests within the SHSA. Volunteers will be sought from the American Birding Association, Audubon Societies and Councils, and through all other normal recruitment avenues.

2. Biologists from the Great Divide Resource Area responsible for the banding study will also spend as much time as possible during the months of April/May/June monitoring all active nests within the bounded study area. They will also be responsible for monitoring all artificial nests outside the bounded study area and any natural nests that are observed to be active.

3. All Great Divide Resource Area field personnel will be trained to look for colored leg bands on any ferruginous hawk they observe in the course of their individual field duties. They will be encouraged to carry spotting scopes with them for this effort.

4. The sample data sheet attached at the end of this study proposal includes the minimum required data elements that all volunteers or staff persons must record. This will ensure consistency of data between years and among data collectors, be they volunteers or staff personnel. These data elements may be changed or modified, but only by the project leader.

D. Reporting Requirements

From the data collected, a number of "results" can be generated. These "results" are listed below under four main headings.

1) Population Density/Population Levels
    a) Number of territorial pairs/year;
    b) Number of breeding pairs/year;
    c) Number of juveniles seen/year/hours spent in the field
    d) Weather, prey populations, and disturbance which could influence a-c above.

2) Productivity
    a) Nest success rates/year;
    b) Nesting phenology (initiation dates, failure or fledging dates);
    c) Fledglings/nest attempt/year;
    d) Fledglings/successful nest/year;
    e) Artificial nesting structure versus natural nest site comparisons;
    f) Weather, prey populations, and disturbance which could influence a-e above.

3) Nest and nest site (breeding area) reoccupancy;
    a) Nest or site reoccupancy (regardless of who the individual birds are);
    b) Fidelity to nest sites by individual birds;
    c) Individual longevity.

4) Recruitment
    a) for the first 10-12 years:
        1) proportion of breeders from local population;
        2) Proportion of breeders from outside the area, or older, unmarked birds.
    b) for years after the first 10-12;
        1) proportion of breeders from local population;
        2) proportion of breeders from outside the area, or older, unmarked birds

All data collected will be included in an annual report similar to current annual reports. Until several years worth of data have been compiled, it will be difficult to draw any overall conclusions. The annual reports will be provided to the Wyoming Game and Fish Department and to the U.S. Fish & Wildlife Service, Cheyenne Office, as part of our individual permit reporting requirements. The annual report will be available to any interested party who requsts a copy.

Prepared by Larry Apple, Wildlife Biologist
Great Divide Resource Area
October 22, 1996

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FERRUGINOUS HAWK/BIRD OF PREY
ARTIFICIAL/NATURAL NEST MONITORING
OBSERVATION FORM

United States Department of the Interior
Bureau of Land Management
Great Divide Resource Area

Nest # ______________________ Date ____________

Species ______________________________________

Location: T.______N., R.______W., Section ________, ______¼, ______¼

USGS Topo Map Name ____________________________

Activity Status: Active _____ Inactive _____ Abandoned _____ ?? _____

If nest was abandoned, what was the date and reason (disturbance, predation, etc., if known). ____________________

Nest Condition: Excellent __; Good __; Fair __; Poor __; Gone __.

Please answer the following about the individual bird or the pair at the nest. If you are not sure, or cannot tell, please respond accordingly. Include remarks in the Comments/Observation section below. Include weather conditions and prey observations. If possible, collect data for both birds of the pair at the nest.

Which is present: One Bird ______ Mated Pair ______ Other ______
(If "Other" explain) ______________________

Is Bird A: Adult _____ Juvenile _____ Immature _____ Not sure ______
Bird B: Adult _____ Juvenile _____ Immature _____ Not sure ______

What color phase/morph? Bird A: Light _____ Dark _____ Not sure ___
Bird B: Light _____ Dark _____ Not sure ___

Is/are Bird(s) Banded? Bird A; Yes ______ No ______ Not sure ______
Bird B; Yes ______ No ______ Not sure ______

Are colored leg bands present and on which leg?

Bird A: Color _________ Right Leg _____ Left Leg _____ Not sure _____
Bird B: Color _________ Right Leg _____ Left Leg _____ Not sure _____

Comments/Observations ______________________________

____

Weather Conditions ______________________________

Prey Observations ______________________________

Observer Name ______________________________

(/home/lapple/raptor/raptstudy.form)

April 1997

APPENDIX 4B

FERRUGINOUS HAWK NEST MONITORING
PREY ITEMS FOUND IN NESTS

APPENDIX 4B

PREY ITEMS NOTED IN FERRUGINOUS HAWK NESTS
GREAT DIVIDE RESOURCE AREA
1993-1998

Nest Number	Date	Prey Items Noted in Nests
AFH21891001	06-25-93	1 13-lined ground squirrel
AFH23953203	06-28-93	2 Wyoming ground squirrels
AFH25912601	06-29-93	1 13-lined ground squirrel; sage grouse feathers
AFH21892202	06-24-94	2 Wyoming ground squirrels
FH23942801	06-29-94	3 voles (species undetermined)
AFH21913303	07-06-94	1 vole (species undetermined)
AFH20900805	06-20-95	1 Wyoming ground squirrel
AFH23942802	06-20-95	2 " " "
AFH21891801	06-22-95	1 juvenile cottontail rabbit
AFH18930601	06-22-95	1 Wyoming ground squirrel
FH17931001	06-22-95	1 " " "
AFH14911201	06-22-95	1 " " "
ASH26901202	06-23-95	1 " " "
FH22800401	06-23-95	1 " " "
AFH23920801	06-26-95	1 " " "
AFH21893001	06-27-95	1 songbird (species undetermined)
AFH25952901	06-28-95	1 Wyoming ground squirrel
AFH25950801	06-28-95	1 " " "
AFH23953203	06-28-95	1 " " "
AFH21892001	06-30-95	1 " " " ; 1 juvenile cottontail rabbit
AFH22903603	06-30-95	1 cottontail rabbit
AFH17931601	05-31-96	1 Wyoming ground squirrel
AFH21903203	06-14-96	1 " " "
AFH20900805	06-17-96	1 " " "
AFH14911201	06-17-96	2 " " "
FH15930901	06-18-96	3 " " "
AFH17931001	06-18-96	1 " " "
AFH23942802	06-19-96	1 " " "
AFH26962901	06-19-96	1 " " "
FH24780402	06-20-96	1 " " "
FH24781991	06-20-96	1 " " " ; 1 13-lined ground squirrel
AFH19832002	06-25-96	1 Wyoming ground squirrel
AFH17931402	06-26-96	1 juvenile cottontail rabbit
AFH21940303	06-26-96	1 Wyoming ground squirrel; 3 cottontail legs in nest
AFH21893001	07-01-96	1 horned lark
AFH21892002	07-02-96	1 Wyoming ground squirrel
FH26900301	07-02-96	3 " " "
AFH21881809	07-02-96	1 vole (species undetermined)
AFH21902802	07-19-96	1 cottontail rabbit
AFH21892002	06-12-97	1 juvenile cottontail rabbit
AFH21923002	06-12-97	1 Wyoming ground squirrel; 1 young sage grouse reported nearby
FH18932102	06-12-97	1 Wyoming ground squirrel
AFH14911201	06-17-97	4 " " "
AFH25921201	06-18-97	1 " " "
AFH21893001	06-20-97	1 " " "

Nest Number	Date	Prey Items Noted in Nests
AFH18932002	06-20-97	1 Wyoming ground squirrel
FH13930701	06-23-97	2 " " "
FH17931401	06-23-97	3 " " "
AFH22893603	06-24-97	1 " " "
AFH21892202	06-25-97	1 " " " ; 1 juvenile cottontail rabbit
AFH21902802	06-25-97	1 sparrow (species undetermined)
AFH17931601	06-25-97	3 Wyoming ground squirrels
AFH23953203	06-26-97	3 " " "
AFH23920801	07-09-97	1 " " "
AFH25923203	07-03-97	2 songbirds (species undetermined; only leg visible in the throats of two nestlings)
AFH21940303	06-03-98	2 Wyoming ground squirrels
AFH23953203	06-03-98	1 " " "
FH24971001	06-03-98	2 " " "
AFH14911201	06-08-98	1 U/I songbird (passerine)
FH17932601	06-10-98	2 Wyoming ground squirrels
AFH25912802	06-11-98	1 " " " (live in nest)
AFH21900401	06-12-98	1 " " "
AFH26952901	06-23-98	1 " " "
FH24971001	06-25-98	1 least chipmunk
AFH21892202	06-26-98	1 U/I small mammal foot in nestling's throat
FH17921002	06-29-98	1 Wyoming ground squirrel
FH18932401	06-29-98	1 prairie dog
AFH25922802	06-29-98	1 prairie dog
AFH21940303	06-30-98	1 Wyoming ground squirrel
AFH23942802	07-01-98	8 " " "
FH22800401	07-03-98	1 prairie dog
AFH24920501	07-03-98	1 prairie vole
FH22893103	07-06-98	1 Western harvest mouse

APPENDIX 4C

Ferruginous Hawk Egg Laying/Hatching Graphs
1993 - 1998

Ferruginous Hawk Egg Laying/Hatching Graphs

The graphs on the following pages are "estimated" egg-laying and egg-hatching dates based on the estimated age of each young ferruginous hawk nestling when it was banded. We have no way to monitor each nest to determine when each egg is laid, so we must rely on this indirect method. The ages are estimated using the aging guide, "Photographic Guide for Aging Nestling Ferruginous Hawks", by Marc Q. Moritsch, published by the Bureau of Land Management, Snake River Birds of Prey Project, Boise District, Idaho, in 1985.

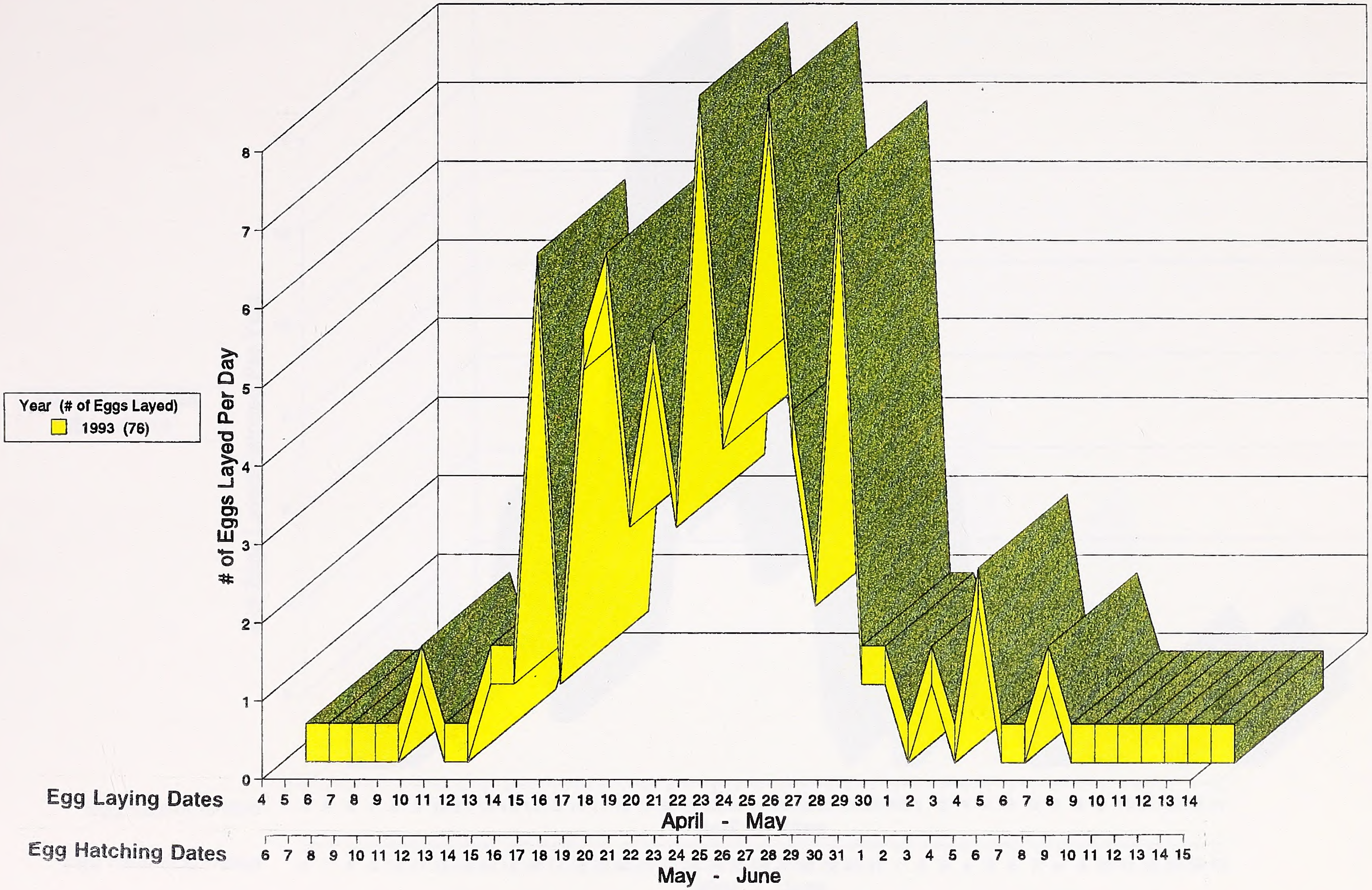
On the day the nestling is banded, its age is estimated. The hatching date is then determined by counting back from the banding date, the age of the bird. For example, if the nestling is estimated to be 36 days old when it is banded on June 23, the hatching date would be 36 days prior to June 23, or May 18.

We then estimate the egg-laying date by using 32 days as the average incubation period for ferruginous hawks (32, 33 and as many as 35 days for incubation have been reported in the literature). To determine the date when the egg was laid, we then count back 32 days from the egg-hatching date. In the example used above, we would then count back 32 days from May 18 (the day the egg hatched) and determine that the estimated date the egg was laid was April 16.

Since we are unable to obtain actual egg-laying and egg-hatching dates for each nestling banded, the egg-laying and egg-hatching graphs are identical because we have used the same incubation period for each bird. This would be unlikely in nature, but is a necessary result of our data collection method. Therefore, for each year of data, the egg-laying and egg-hatching data is represented by one graph with a separate set of dates each for egg-laying and egg-hatching.

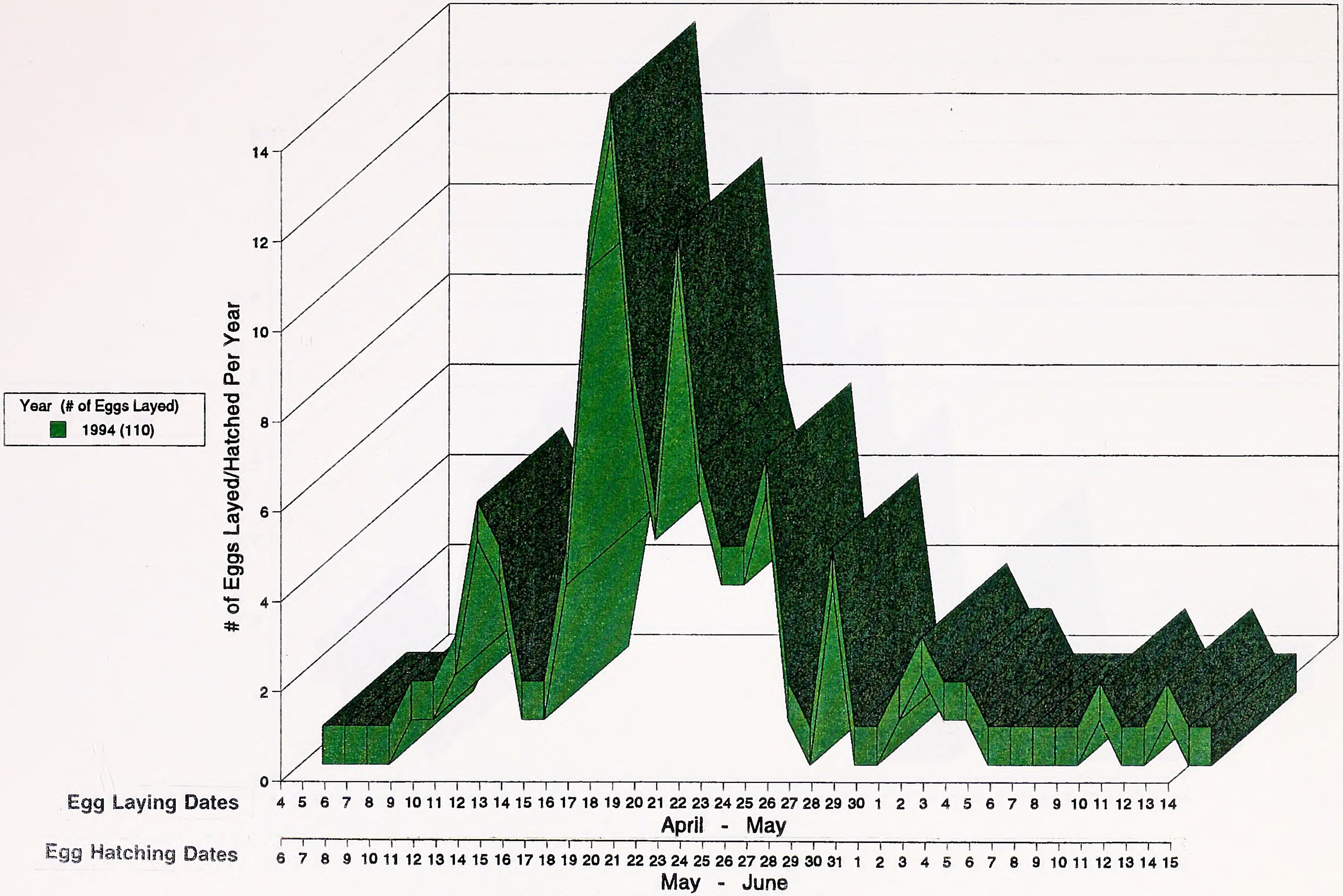
Egg Laying-Hatching Chronology for Ferruginous Hawks

Great Divide Resource Area - 1993



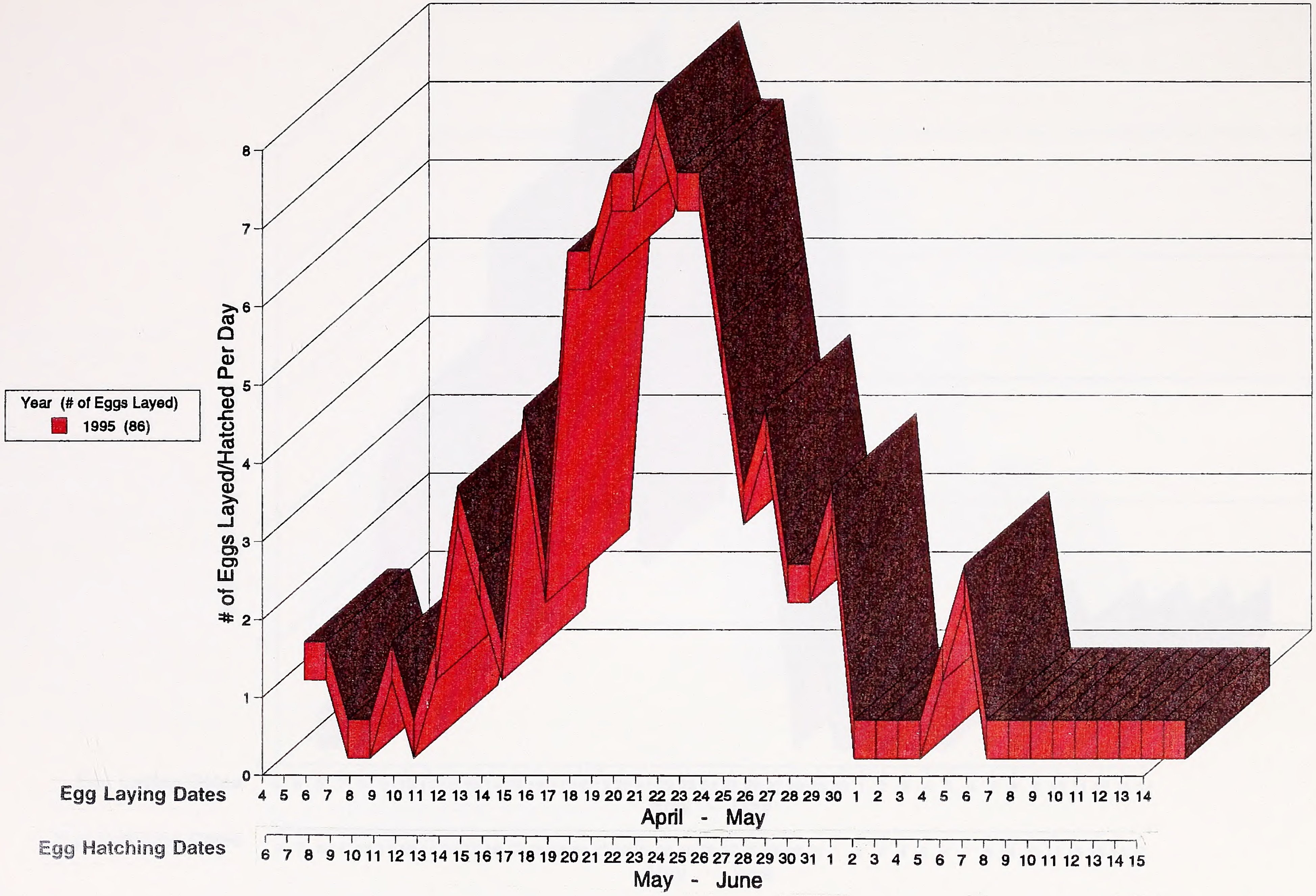
Egg Laying-Hatching Chronology for Ferruginous Hawks

Great Divide Resource Area - 1994



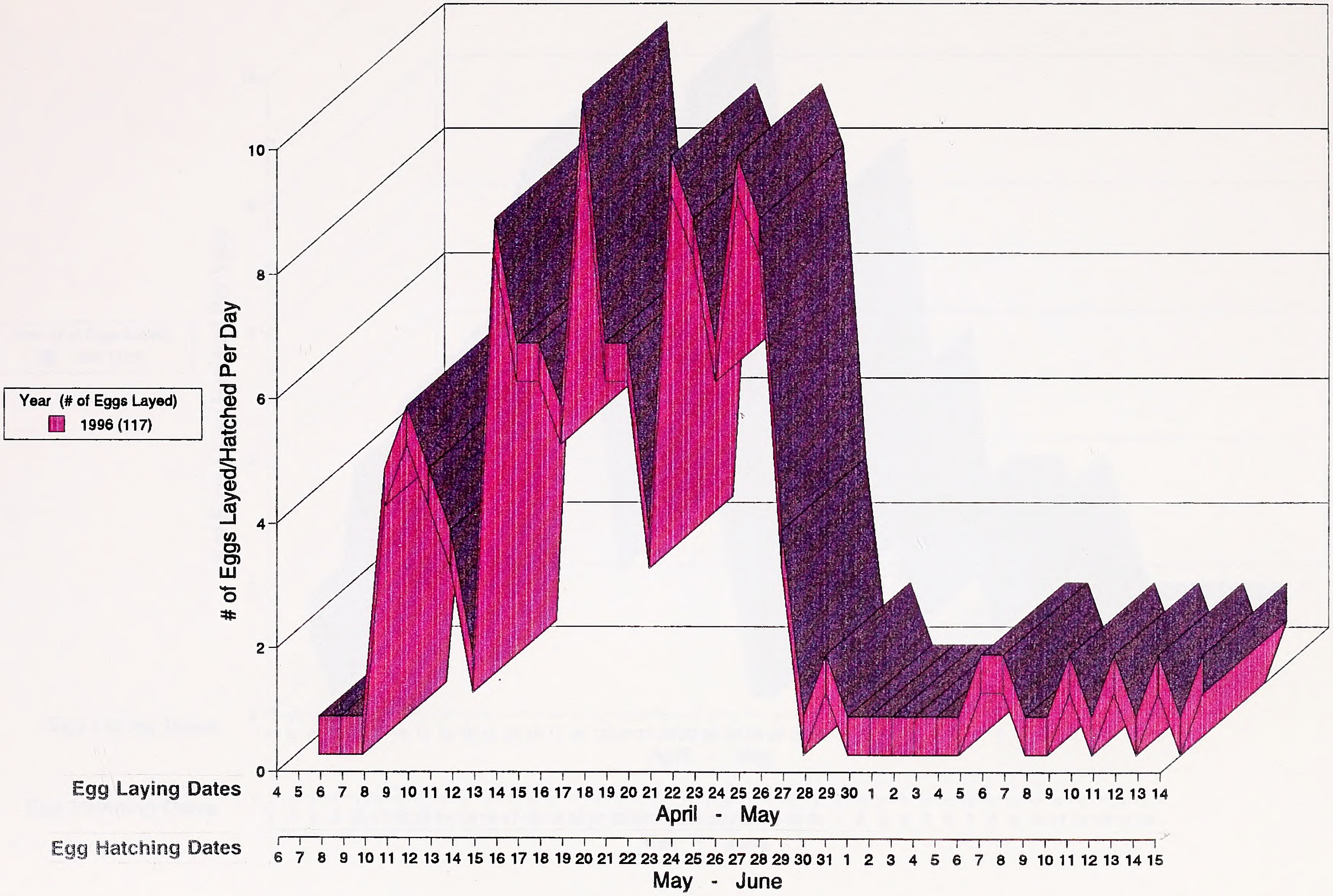
Egg Laying-Hatching Chronology for Ferruginous Hawks

Great Divide Resource Area - 1995



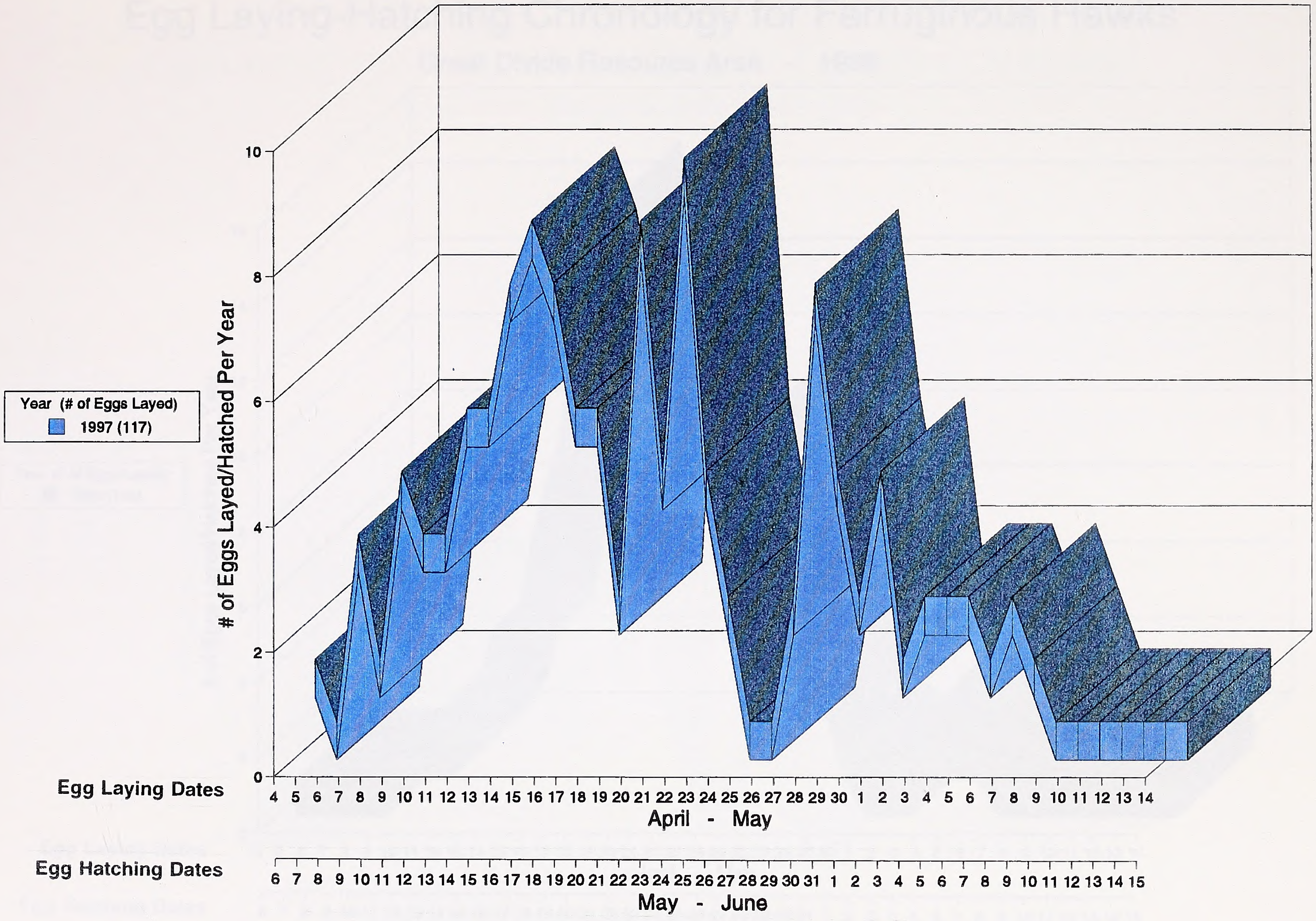
Egg Laying-Hatching Chronology for Ferruginous Hawks

Great Divide Resource Area - 1996



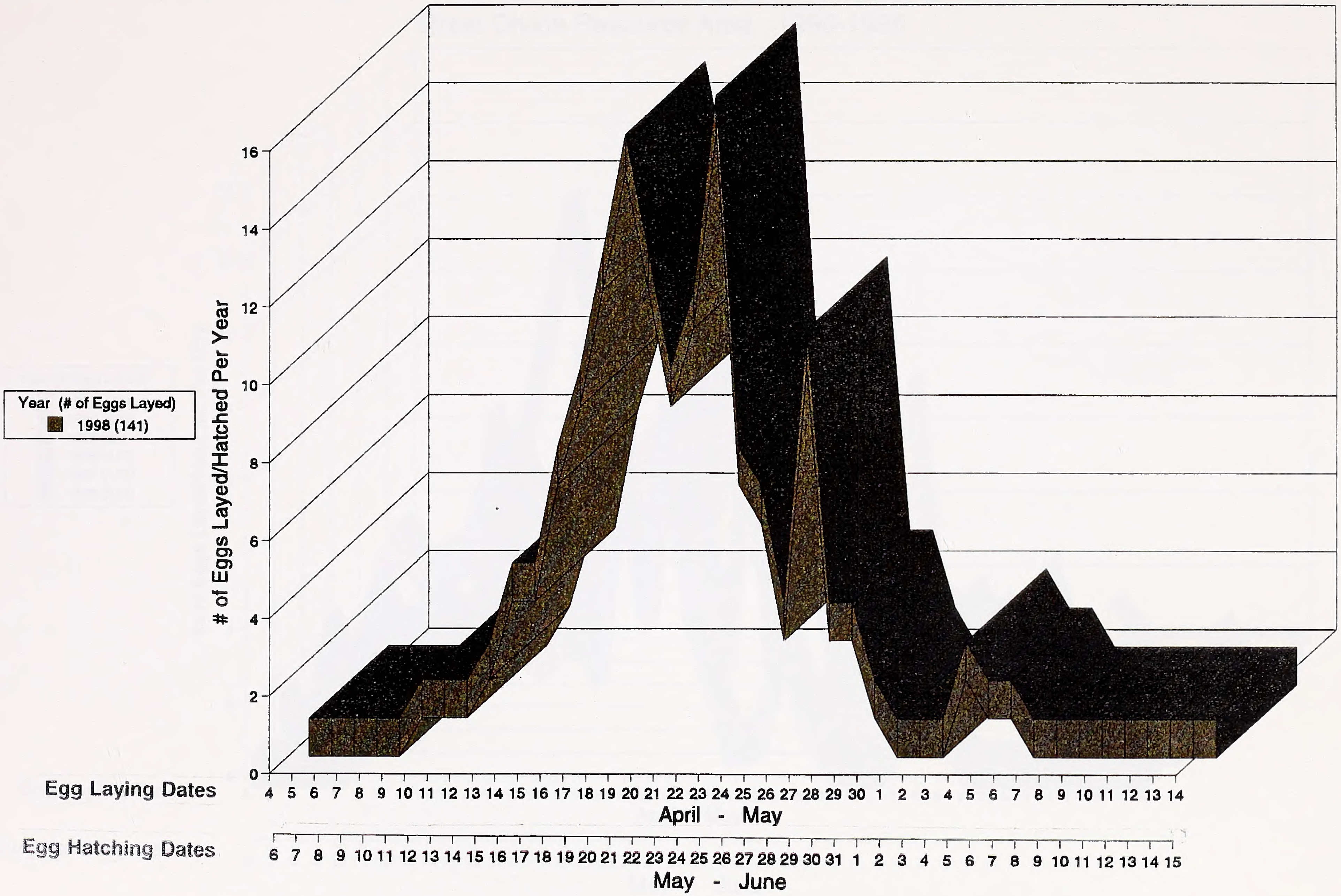
Egg Laying-Hatching Chronology for Ferruginous Hawks

Great Divide Resource Area - 1997



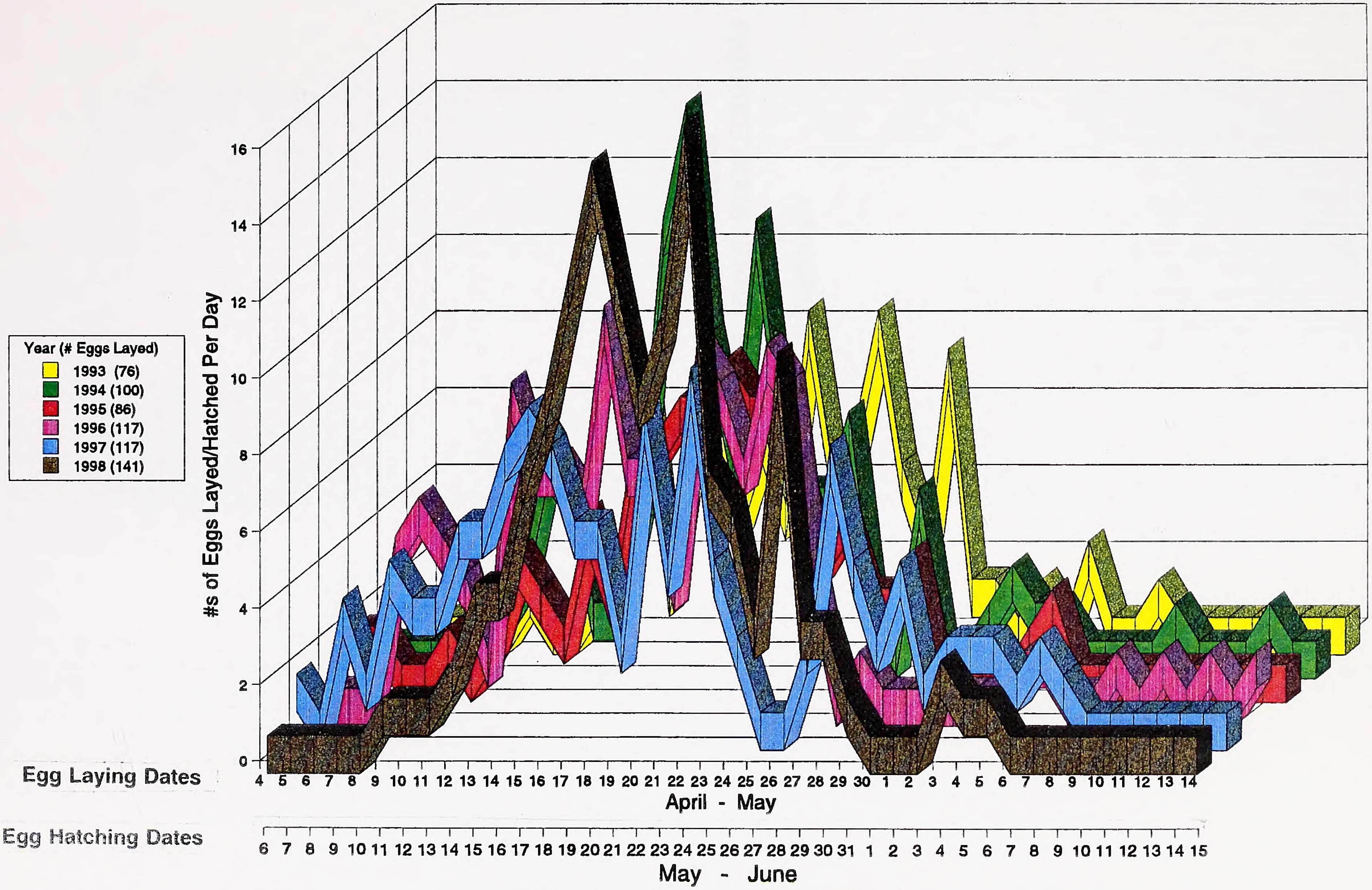
Egg Laying-Hatching Chronology for Ferruginous Hawks

Great Divide Resource Area - 1998



Egg Laying-Hatching Chronology for Ferruginous Hawks

Great Divide Resource Area 1993-1998

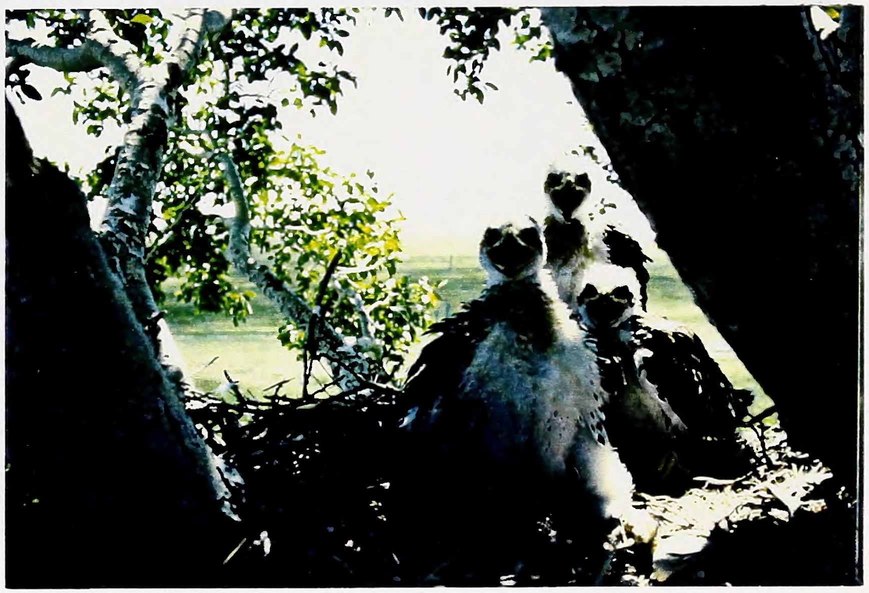


APPENDIX 4D

FERRUGINOUS HAWK BANDING STUDY PHOTO LOG FOR 1998

FH24780402

Nest #FH24780402 was first surveyed in 1992. This is not a typical ferruginous hawk nest. It may have been originally constructed by a red-tailed hawk. Since 1995, this nest has been very productive and very consistent. In 1998 this nest was first checked on May 12 and was found to be active. We attempted to check the age of the young on June 09, but were unable to do so. Both adults were continually present, either in the nest tree or perched on powerline poles nearby. Three young were banded on June 22, 1998.



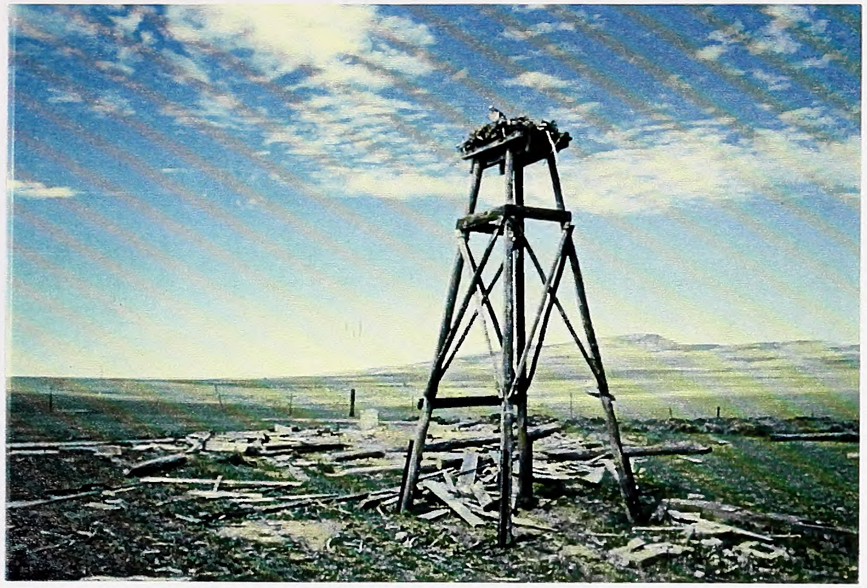
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

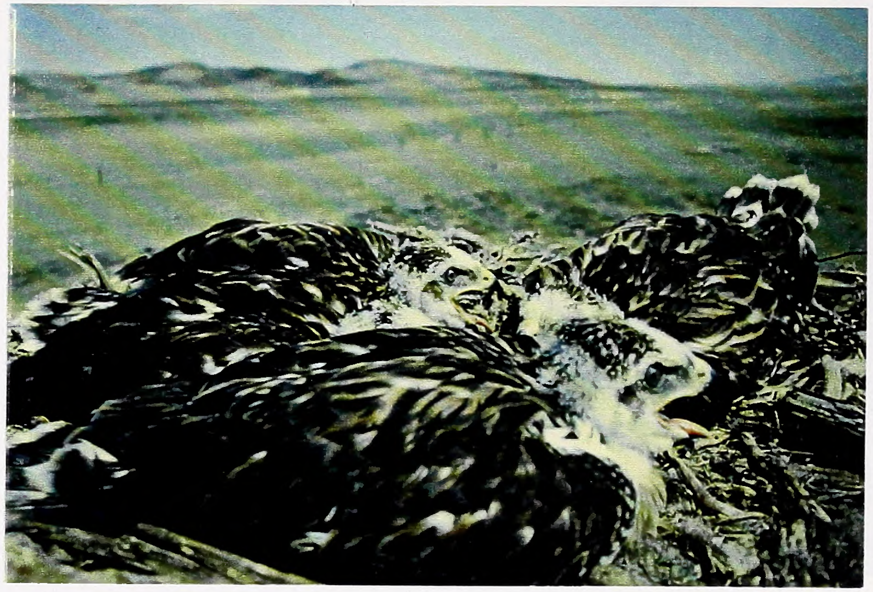
BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH24780402	?	?	?	?	?	?	?	FH 4Y'	FH 3Y'	FH 3Y'	FH 3Y'					T B Ranch	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

FH24781001

Nest # FH24781001 has probably been around for several years noting the apparent age of the windmill it is built on, but was not first noted until 1996, when three young were raised and subsequently banded. This nest failed in 1997, probably due to human disturbance nearby, when the adults abandoned the nest, leaving 1 egg. In 1998 this nest was first checked on May 12 and it was found to be active. The ages of the young birds were estimated on June 09, and on June 22, 4 young were banded.





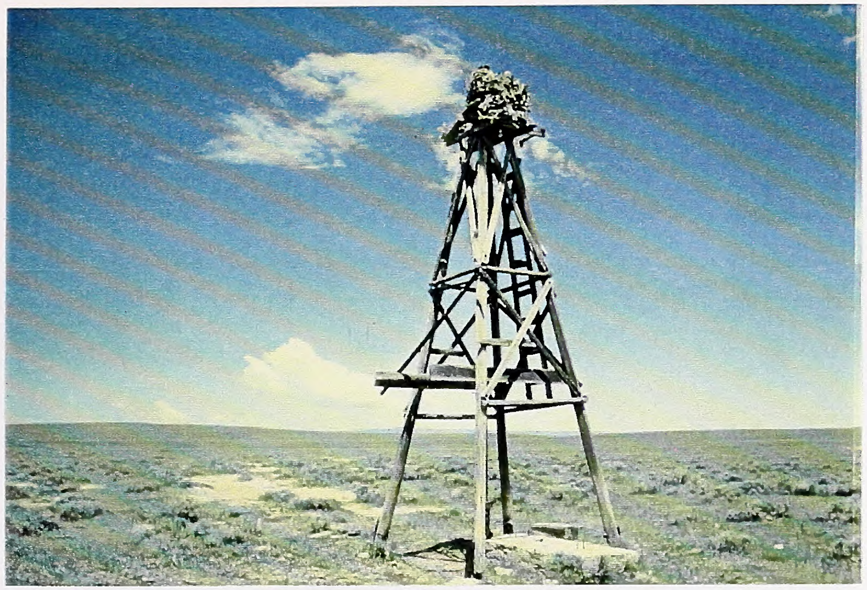
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

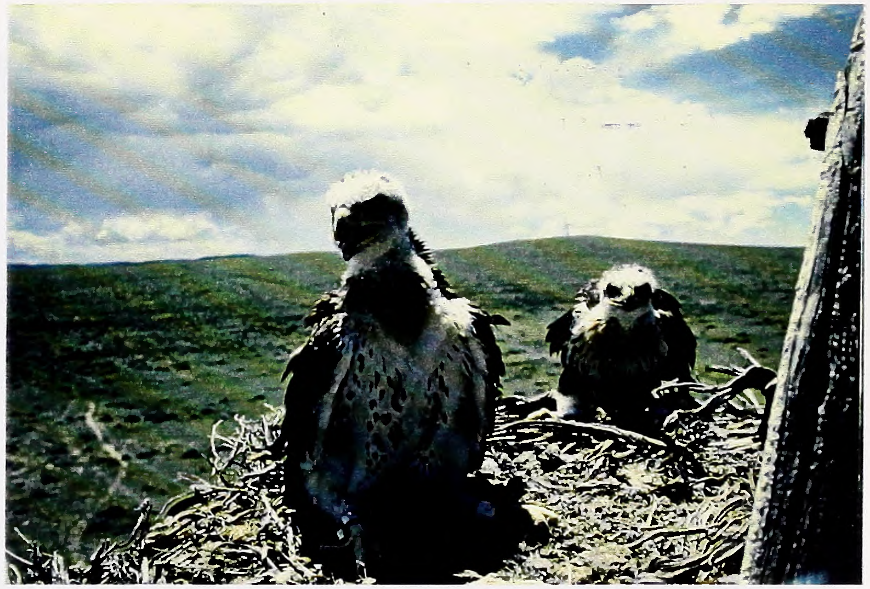
BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH24781001	?	?	?	?	?	?	?	?	FH 3Y'	FAILED 1E	FH 4Y'					T B Ranch	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

FH22792601

Nest #FH22792601 was added to the inventory in 1995 when it was found during a survey for the Kenetech Windpower Project. That year 2 nestlings were raised and were banded. In 1996 the nest was inactive, and in 1997 the nest failed when the adults abandoned the nest, leaving behind 4 eggs. The reason for the abandonment is not known. In 1998 this nest was first surveyed on May 12 and was found to be active. On June 09 the young were aged, and on June 22, 2 young were banded. This is another old abandoned windmill, and the nest has probably been in place for many years, most likely long before it was discovered in 1995.





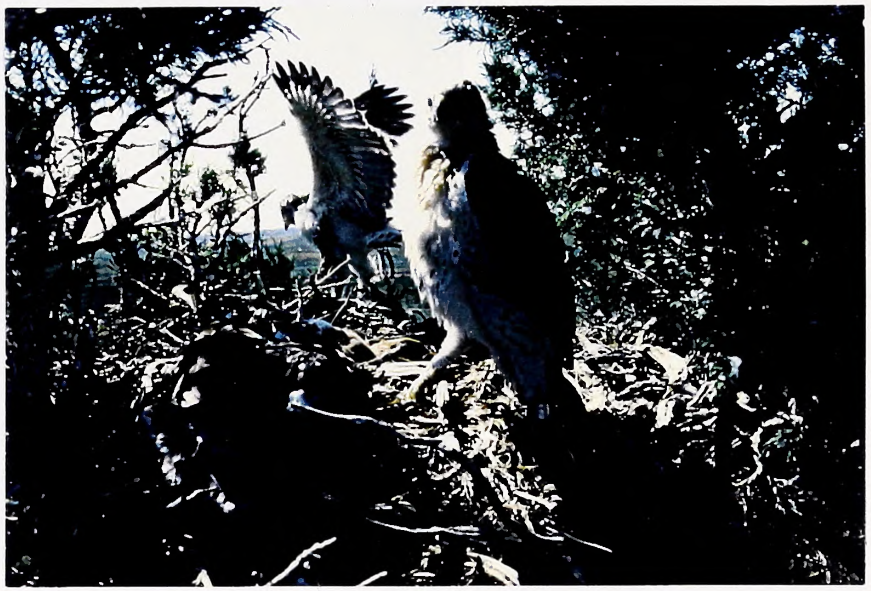
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH22792601	?	?	?	?	?	?	?	FH 2Y'	?	FAILED 4E	FH 2Y'					Pine Ridge	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

FH22800401

Nest # FH22800401 was first noted active in 1978 when three young were raised. This is not a typical ferruginous hawk nest found in a juniper tree because it is not at the top, but within the canopy of the tree. This nest has been remarkably consistent over the years since its discovery (for the years it has been checked). This year the nest was first checked on May 12 and there was no sign of activity, although a single ferruginous hawk adult was seen flying in the area. The nest was casually observed on a weekend drive-by on June 20 and it appeared that young, downy, white nestlings were in the nest. The nest was more closely checked on June 23 and 2-3 young were observed and age estimates were taken. On July 03, 1998, 3 young birds were banded.



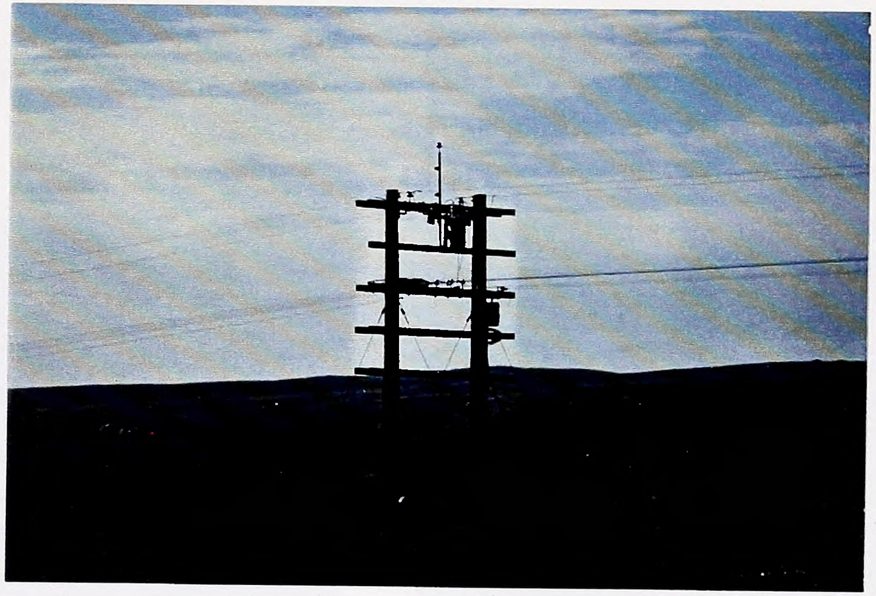
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH22800401	?	?	FH ?Y	FH ?Y	?	FH 3Y'	?	FH 3Y'	FH 3Y'	IA	FH 3Y'					Como West	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

FH22800402

Nest # FH22800402 was first observed while monitoring other ferruginous hawk nests, on May 12, 1998. The nest is adjacent to the Union Pacific Railroad track where Highway 30 crosses the railroad between Hanna and Medicine Bow, Wyoming. The nest is on a powerline pole and a female ferruginous hawk was in an incubation posture on the nest. The nest was again checked on June 23, and the female was still incubating. When the nest was checked on July 03, when the nestlings at FH22800401 were banded, there were no young in this nest, and only one adult was seen, perched on the ground about 300 yards to the south. The fate of the eggs (if any) or young is unknown. We made no plans to band from this nest because it is too high.



INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH22800402	?	?	?	?	?	?	?	?	?	?	FAILED					Bush Lake	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; · = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ° = Birds Banded.

AFH19832002

Nest # AFH19832002 was constructed in April of 1993 as mitigation for a natural ferruginous hawk nest built on a Wyoming Department of Transportation gravel pile at a gravel quarry. The nest was not used during the 1993 nesting season, but has been active and very productive every year since. AFH19832002 was first checked this year on May 12, and was found to be active. The nest was visited again on June 09, 1998, but the soil was too wet to approach the nest closely enough to determine the number and age of the young. There were three young seen at a distance. On June 26 the nest was visited for the last time, and four young were banded.

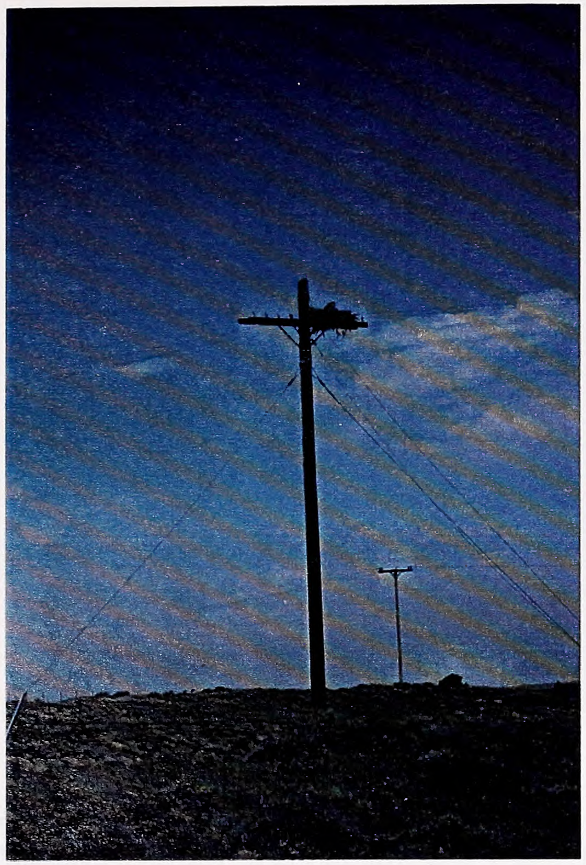
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH19832002	-	-	-	-	-	IA	FH 2Y'	FH 3Y'	FH 3Y'	FH 3Y'	FH 4Y'					Overland	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

FH21842502

Nest # 22842502 is a newly discovered natural nest this year. It is more than likely that this is the first year for this nest because of the precarious nature of the nest location. This nest was first noticed on May 12, 1998. It is located just to the north of U.S. Highway 30, about 1 mile north of Walcott Junction. When the nest was checked again on July 3, 1998, there was one nestling. This nest is too high for us to be able to band from, so this nestling was not banded.



INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH2142502	?	?	?	?	?	?	?	?	?	?	FH 1Y					Rawlins Peak SW	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ` = Birds Banded.

AFH21881809

Nest # AFH21881809 was constructed in the fall of 1987 as mitigation for the anticipated loss of natural ferruginous hawk nesting sites because of the development of an underground coal gasification project. It was used in 1988, the first year after it was placed, and has been a very productive nest since. When first checked on March 20, and again on March 24, the nest did not appear to be active. Then when checked on April 29 a female was observed incubating(?) eggs. On June 12 the nest was again checked and 4 young were estimated to be between 26 and 30 days old. All 4 young were banded on June 19, 1998.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH21881809	FH 3Y	FH 3Y	FH 3Y	FH 3Y	FH 3Y	FH 3Y'	IA	IA	FH 1Y'	FH 1Y'	FH 4Y'					Rawlins Peak	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH21890401

Nest #AFH21890401 was constructed in the fall of 1987 as mitigation for the anticipated loss of natural ferruginous hawk nesting sites because of the development of an underground coal gasification project. This nest has had sporadic use since it was built. It was first visited on April 28 this year, and an adult flushed from the nest at 20 yards. The nest was again visited on May 19 and thought to be inactive. However, when rechecked on June 12, both adults were present, and 3 young were estimated at 11-15 days old. We banded 2 of these young on July 6, 1998, the third nestling was not there. Its fate is unknown. It is possible, though we have no way to prove it, but the early visit which caused the bird to flush may have caused the pair to delay egg laying. The young fledged later than most young this year.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH21890401	-	FH 3Y	FH 2E/1Y	IA	IA	IA	FH 3Y*	IA	IA	FH 3Y'	FH 3Y'					Rawlins Peak SW	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH21891408

Nest # AFH21891408 was constructed in the spring of 1990 as mitigation for the anticipated loss of natural ferruginous hawk nesting sites because of the development of an underground coal gasification project. The original coal gasification project which began in 1987 had failed to economically demonstrate the technology. From the time the project was abandoned in 1989 until 1993 when the project was resurrected under new ownership, this nest was active. In 1994 and 1995, with the coal project in full operation, the nest was inactive. We moved it in the fall of 1995 to get it farther away from the base of operations for the coal project. The second coal project was abandoned in 1996 and in 1997 this nest was again active. The nest was checked on April 24 this year and it was inactive. It was checked again on April 28 and an adult was seen on the nest. The ages and numbers of young were checked on June 12, and 2 young were counted. They were banded on July 7, 1998.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH21891408	-	-	FH 2Y	FH 3Y	FAILED 3E	FH 3Y'	IA	IA	IA	FH 1Y'	FH 2Y'					Rawlins Peak SW	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH21891801

Nest # AFH21891801 was constructed in the spring of 1988 as mitigation for the anticipated loss of natural ferruginous hawk nesting sites because of the development of an underground coal gasification project. This structure was not used for several years, but has been active every year since 1992. AFH21891801 was active when first checked on April 23 of this year. The young were estimated to be from 19 to 22 days old when rechecked on June 12. Three nestlings were banded on June 26, 1998.

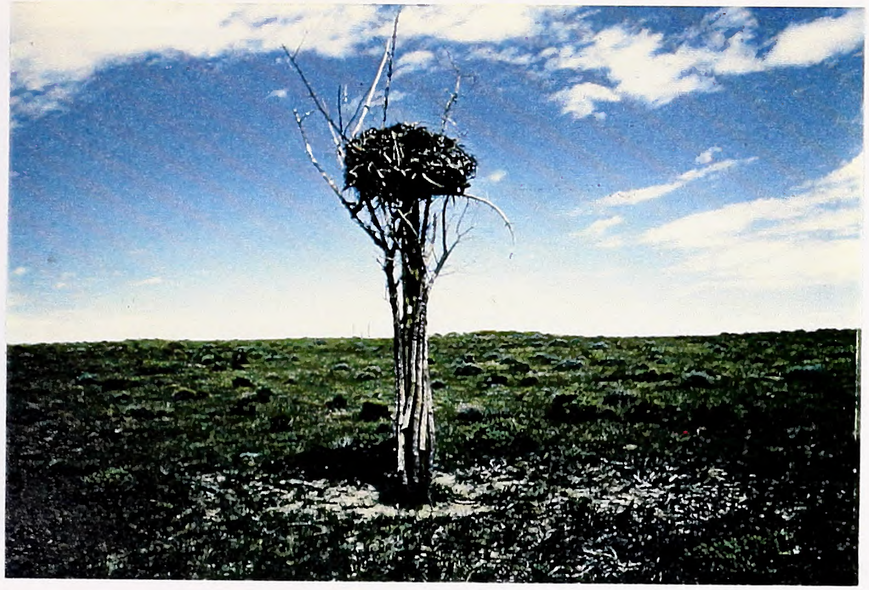
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

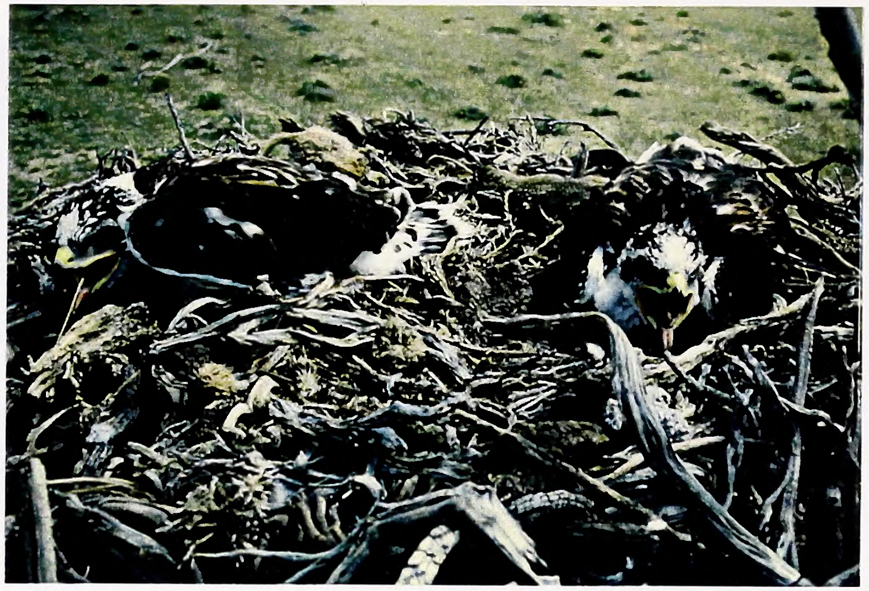
BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH21891801	-	IA	IA	IA	FH 2Y	FH 2Y'	FH 4Y'	FH 2Y'	FH 3Y'	FH 3Y'	FH 3Y'					Antelope Spring	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH21892202

Nest # AFH21892202 was constructed in the fall of 1987 as mitigation for the anticipated loss of natural ferruginous hawk nesting sites because of the development of an underground coal gasification project. It has been used about half of the time since then. AFH21892202 was active when first checked on April 28 of this year. Two nestlings, estimated at 20-22 days old were observed when we next checked the nest on June 12. These 2 young were banded on June 26, 1998. One of the nestlings has not completely swallowed breakfast becaue we could see the foot of a small mammal (presumably a Wyoming ground squirrel) in its throat.





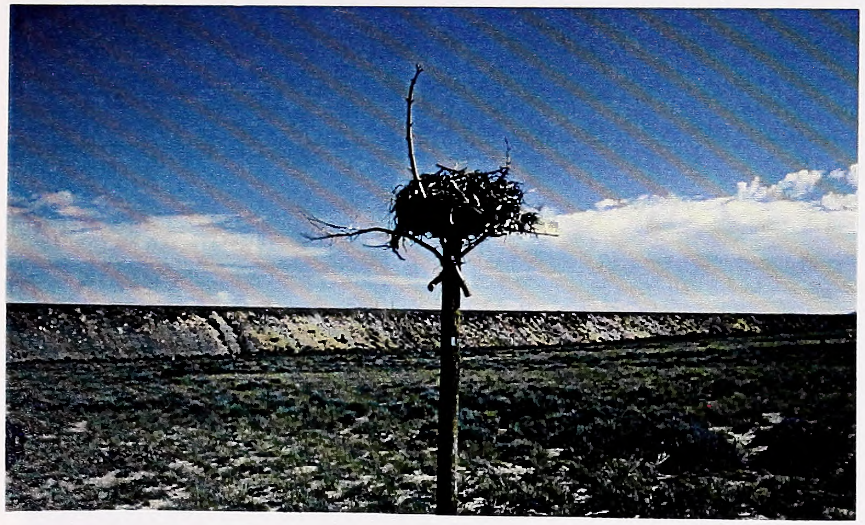
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

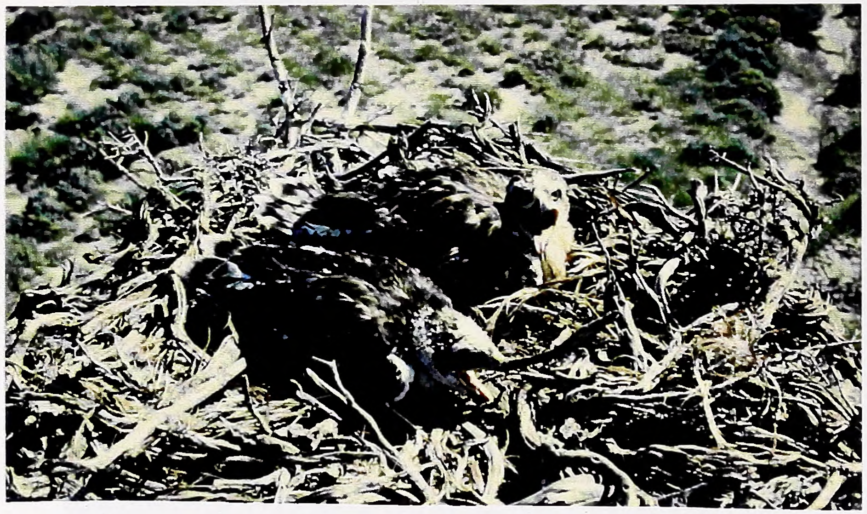
BLM Nest Number	198B	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH21892202/ AGE21892201	IA	FH 3Y	IA	GE 1Y	IA	IA	FH 1Y'	FAILED	IA	FH 1Y'	FH 2Y'					Rawlins Peak SW	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH21892604

Nest # AFH21892604 was constructed on August 22, 1991 to attract a nesting pair away from FH21892603, a natural nest on a boulder along the Union Pacific Railroad right-of-way grade. The structure was moved 200 yards to the NE on June 28, 1996 to attract the nesting pair from another railroad right-of-way boulder. The young were placed on the structure, and 2 weeks later the adults were still feeding and attending to the young. We first checked this nest this year on April 21. There was no sign of activity, and we assumed that the nest would not be used in 1998. However, on June 26, the nest was checked again and 2 young were discovered on the nest, approximately 30 days old. We quickly rearranged our banding schedule and these nestlings were banded on July 02, 1998.





INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

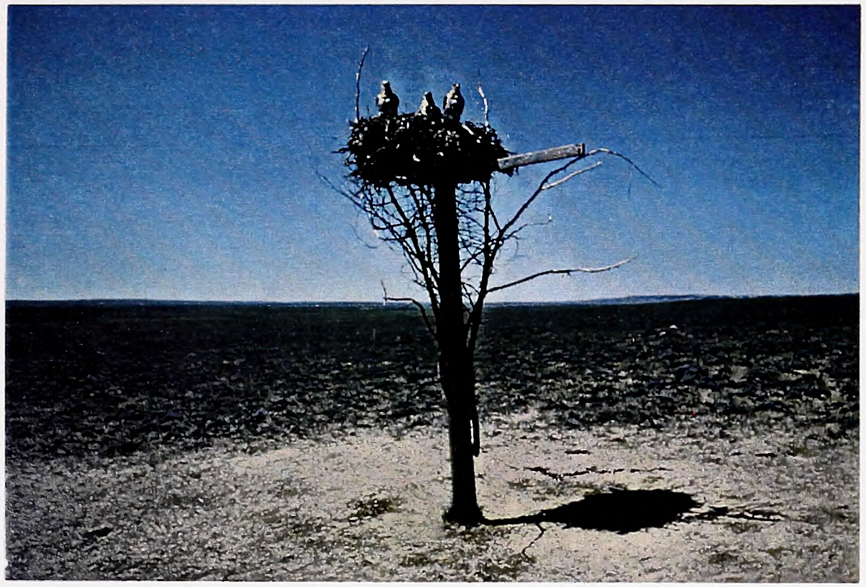
BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH21892604	-	-	-	-	FH 3Y	FH 1Y'	FH 3Y'	FH 2Y'	IA[1]	FH 3Y'	FH 2Y'					Antelope Spring	

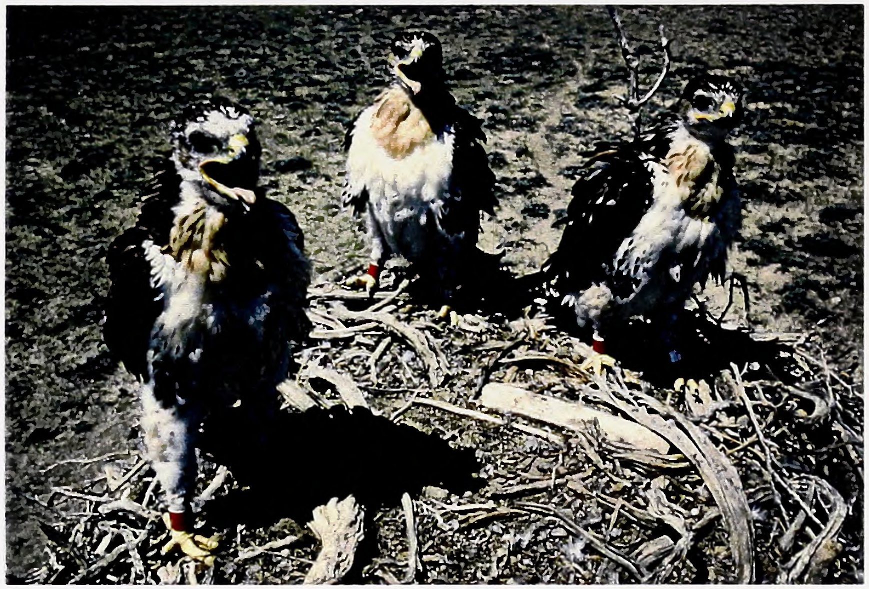
[1] FH21892605, another natural nest on the railroad right-of-way grade was active in 1996. The artificial structure was moved closer to the active natural nest and after we banded the young we transferred them to the artificial structure. In essence, the artificial structure was active for the last 2-3 weeks before the young fledged. It is counted as inactive because the adults chose the natural nest at the start of the nesting season

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH22891801

Nest # AFH22891801 was constructed in the fall of 1988 as mitigation for the anticipated loss of natural ferruginous hawk nesting sites because of the development of an underground coal gasification project. Since first being available for nesting use in the spring of 1989, this nest has been active every year but one. We first visited this nest on May 19 this year, and determined it to be active. When we returned to check the number and ages of young, we found 3 nestlings from 13 to 17 days old. We returned to band the young on July 02, 1998.





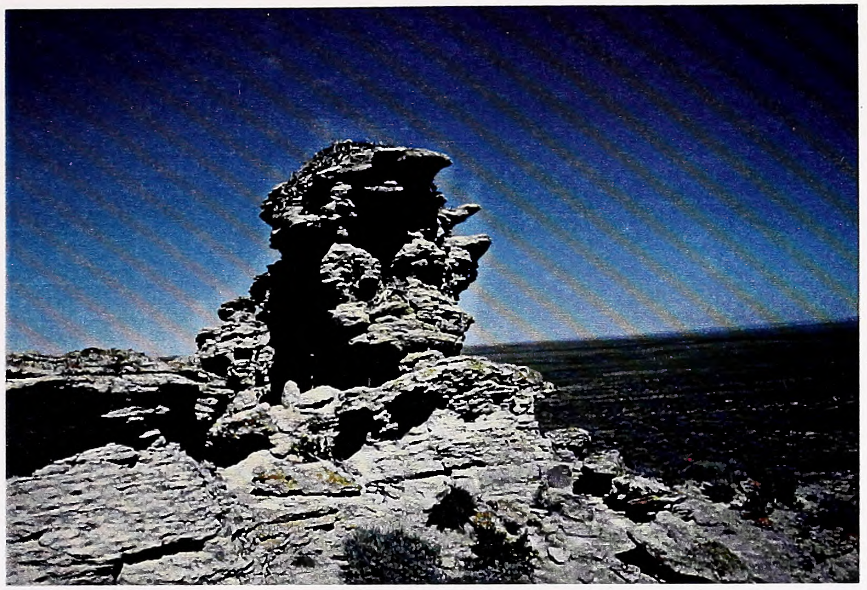
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH22891801	-	FH 3Y	FH 3Y	FH 3Y	IA	FH 3Y'	FH 2Y'	FH 2Y'	FH 1Y'	FH 2Y'	FH 3Y'					Rawlins Peak SW	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

FH22892103

Nest # FH22892103 was first surveyed in 1988 when the nest was evaluated to be in "fair" condition, but it produced 3 young to fledging age. In 1989 three young were produced again, but only 2 survived to fledge. For a 4 year period this nest was not checked. Since it has been active from 1994 through 1998, there is a very good possibility that during the 4-year gap when no survey efforts took place, the nest was active, at least some years. This nest was first checked on April 30 of this year and found active. The young were aged on June 10, and 3 young were banded on July 06, 1998. This is a very secure nest site, not vulnerable to any ground predator. Note the western harvest mouse in the nest.



INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH22892103	FH 3Y	FH 2Y	?	?	?	?	FH 3Y'	FH 2Y'	FH 2Y'	FH 3Y'	FH 2Y'					Rawlins Peak SW	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; · = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH20900805

Nest # AFH20900805 was constructed on May 3, 1989 to replace AFH20900801, a nest on a power pole. The pole had been cut down by vandals. This nest was inactive when first checked this year on April 16. However, when it was rechecked on April 24, an adult flushed from the nest, and we changed the status to active. We returned to determine the ages and the number of young in the nest on June 12. Two young were present, estimated to be from 24 to 28 days old. We returned on June 22, 1998 to band these 2 nestlings. The photographs were overexposed and not usable. The photograph of the structure is from a previous year.

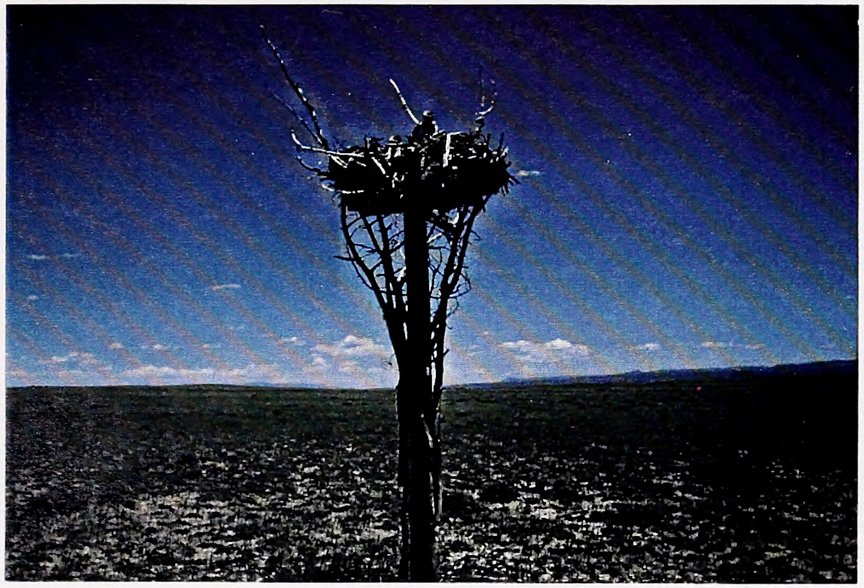
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

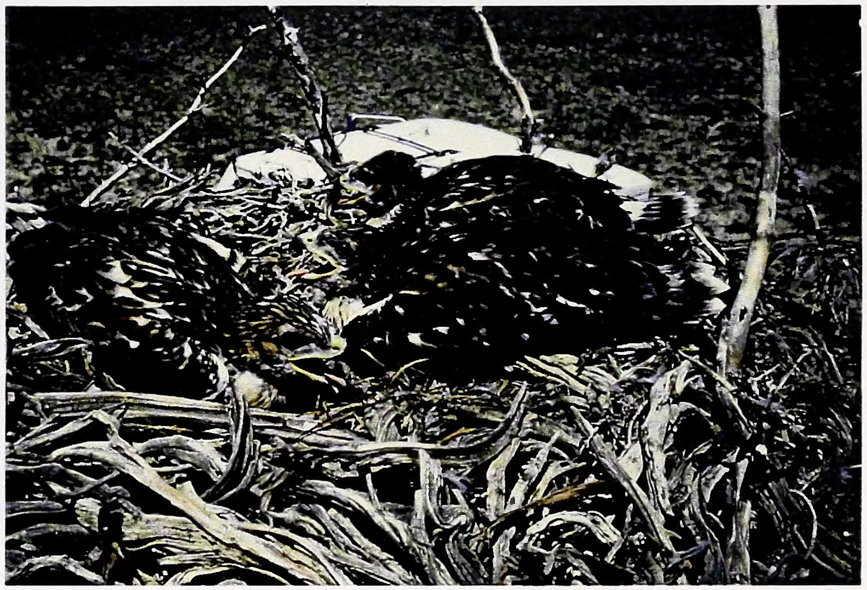
BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH20900805	-	-	IA	IA	FH 3Y	?	IA	FH 1Y'	FH 1Y'	FH 1Y'	FH 2Y'					Riner	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH21900401

Nest # AFH21900401 was constructed on October 17, 1997 to replace nest FH21900301 which was active and produced 3 young in 1997. FH21900301 had been built on a condensation tank at a gas well, and in the late summer or early fall of 1997, the tank was remove. This artificial nesting structure was built in hopes that it would be used when the nesting pair returned in 1998 and found their previous year's nest was gone. It was a disappointment this year to find the nest unused when we first checked it on April 23. We rechecked the nest on May 19, and happily, it was in use. Two adults were present, defending the nest and territory. Three nestlings from 11-15 days old were observed on June 12, and we returned to band these young on July 06, 1998.





INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH21900401	-	-	-	-	-	-	-	-	-	-	FH 3Y'					Antelope Spring	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH21902601

Nest # AFH21902601 was built in 1980 but the nest blew off in the fall of that year. A more substantial nest platform was erected by Pacific Power and Light Company (PP&L) in 1988. This nest has been used by ferruginous hawks and golden eagles since then. This nest was first noted active on March 24 of this year. By May 19, when the young were standing up in the nest, we were able to count 4 nestlings. Because the nest is too high to band from, none of these nestlings were banded.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH21902601	FH 2Y	FH 3Y	FH 3Y	FH 3Y	FH 1Y	IA	IA	FAILED	FH 3Y	GE 1Y	FH 4Y					Antelope Spring	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; * = Birds Banded.

AFH21903203

Nest # AFH21903203 was constructed in the spring of 1989 as mitigation for anticipated impacts caused by a U.S. Air Force radar bombing site. It has been used fairley consistently since then with only 2 years of inactivity. The nest was first checked on March 20 but no sign of activity was observed. We again checked on March 24, and there appeared to be an adult on the nest. On May 19 we confirmed that the nest was active, and On June 12, we found the nest occupied by 3 young, from 24 to 26 days old. We returned on June 25 and banded these three nestlings.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH21903203	-	FH 2Y	FH 3Y	FH 3Y	FH 3Y	FH 3Y'	IA	IA	FH 2Y'	FH 2Y'	FH 3Y'					Antelope Spring	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

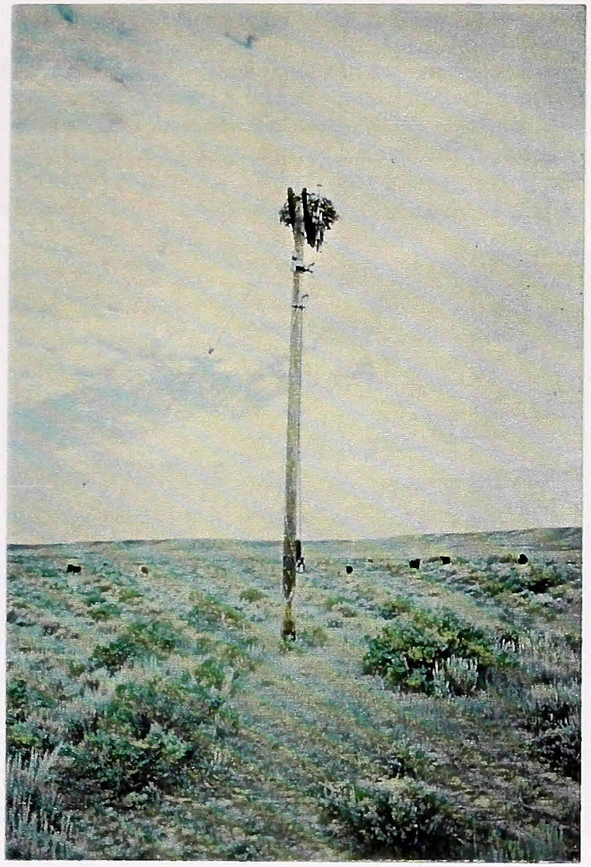
AFH14911201

Nest # AFH14911201 was constructed in 1991 to draw a nesting pair of ferruginous hawks away from a nest on a condensation tank (Browning Federal 412 Well). Since 1991 this nest has been active every year that it has been checked. We failed to check this nest in 1994. Because of its remoteness, it is likely that it was active in 1994. This nest was active when we first checked it this year on April 27. Four nestlings between 19 and 22 days old were recorded on June 08, but only 3 young were later banded on June 23, 1998. The fate of the fourth nestling is unknown.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH14911202	-	-	-	-	FH 3Y	FH 3Y	?	FH 3Y*	FH 4Y*	FH 2Y*	FH 3Y*					Smiley Draw	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; * = Birds Banded.



AFH20910501

Nest # AFH20910501 is a nest built on an abandoned power pole, and is a nest that we have not monitored in conjunction with our artificial nest program. It has, however, been available for ferruginous hawk nesting since before 1988. The nest is too high to band from and this may be a reason why it has not been closely in years past. This nest was active in 1995 and 1996, but the number of nestlings was not recorded. In 1997 there were 4 nestlings, and in 1998 there are again 4 nestlings. This nest will be more closely monitored in the future, even though we do not plan to band young raised here.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH20910501	?	?	?	?	?	?	?	FH ?Y	FH ?Y	FH 4Y	FH 4Y					Smiley Draw	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH21913303

Nest #AFH21913303 was built on November 5, 1990 from a design by Lynn Hull as an art project. It consists of a perch pole and a separate artificial nesting structure. This structure is located next to Interstate Highway 80 west of Rawlins, and is accompanied by an interpretive sign. The nest was inactive from 1995 through 1997, and when checked on March 20, it was also inactive this year. Checked again on June 16, we were very surprised to find that the nest was being used by a pair of Swainson's hawks. We have banded from this structure before but our permit is only for ferruginous hawks. One young was raised, but it was not banded. This photo was taken on July 08,1998.

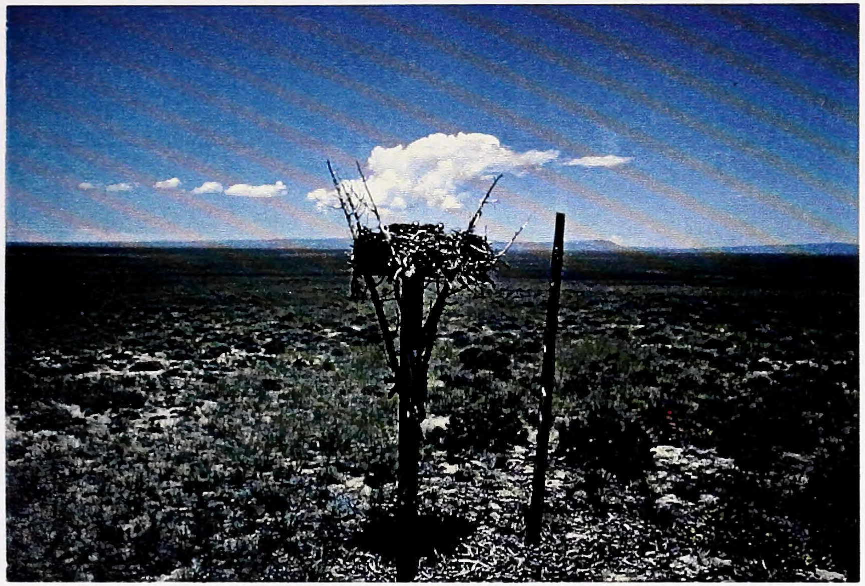
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH21913303	-	-	-	FAILED	FH 2Y	FH 1Y'	FH 2Y'	IA	IA	IA	SW 1Y					Creston Junction	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; SW = Swainson's Hawk: Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH23910202

Nest # AFH23910202 was constructed on April 27, 1988 to replace an old, vulnerable natural nest next to an old corral structure. This artificial structure has been very productive over the years, but four eggs were laid in 1997 and the nest was then abandoned. When first checked this year, on April 28, 1998, the nest was active but the adults seemed relatively intolerant of disturbance. We waited until June 03 for fear of causing nest abandonment if we visited the nest earlier. When we checked the nest again for the age and number of nestlings, and we found 2 young approximately 7 days old. We returned on July 02, 1998 to band these two nestlings.



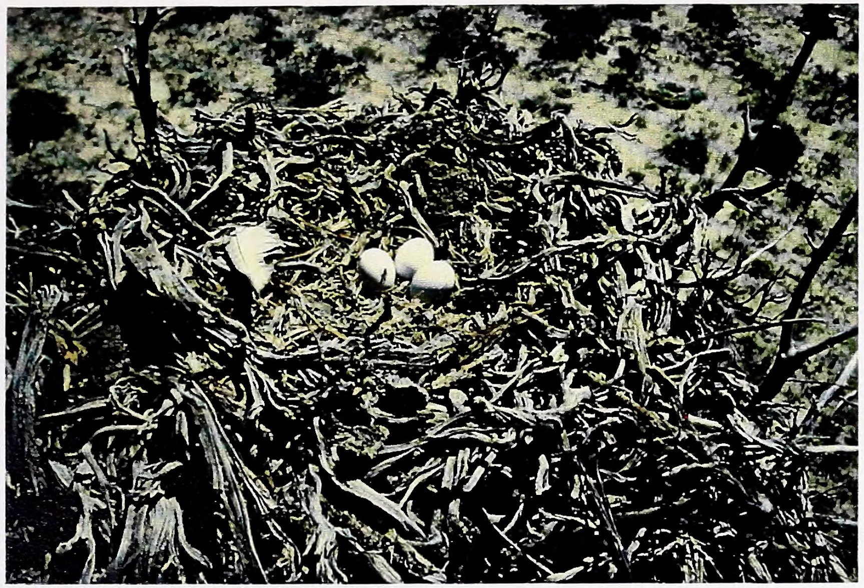
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

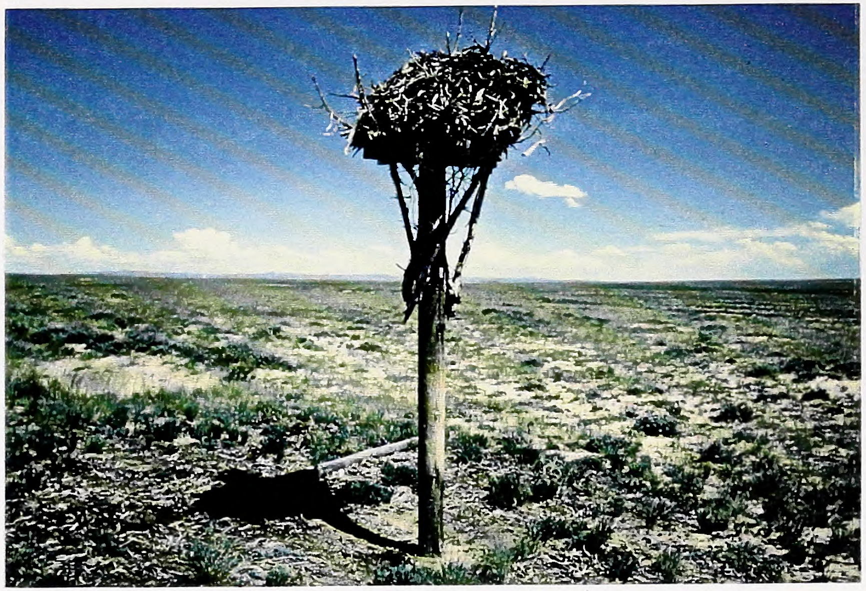
BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH23910202	FH 4Y	FH 2Y	FH 4Y	FH 4Y	FH 1Y	FH 1Y	IA	FH 3Y°	FAILED	FAILED 4E	FH 2Y°					Larsen Knoll	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ° = Birds Banded.

AFH23910801

Nest # AFH23910801 was constructed on August 08, 1987 to enhance ferruginous hawk nesting opportunities northwest of Rawlins. This nest has been very productive, being active and producing young every year but one since 1988. The nest was active again when checked this year on April 28, when the one adult was present at the nest. On June 03 we checked the nest again, but the female who was incubating eggs was so low in the nest cup that we could not see her until we approached to within 20 yards. She flushed, and we quickly checked the nest. Four eggs were present. We returned on June 30 to check ages and the nest had been abandoned. There were no adults present, and only 3 of the 4 eggs were still in the nest.





INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH23910801	FH 5Y	FH 2Y	FH 3Y	FH 3Y	FH 3Y	FAILED	FH 3Y'	FH 2Y'	FH 2Y'	FH 3Y'	FH 3E Failed					Larsen Knoll	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH24910801

Nest #AFH24910801 was constructed on August 26, 1988 to enhance ferruginous hawk nesting opportunities northwest of Rawlins, in the Stewart Creek area where many nests have been constructed on large sagebrush plants. This nest has been sporadically active over its 11 year existence. After three years of being inactive, this nest was thought to be inactive again this year when we checked iton April 15. However, on April 28, a female was seen incubating on this nest. We checked again on June 11, and found 3 young ranging from 11 to 15 days old. We returned on July 03, 1998 and banded these nestlings.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH24910801	-	FH 3Y	FH 3Y	IA	FH 2Y	FAILED	FH 2Y'	IA	IA	IA	FH 3Y'					Chicken Spring	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH24913403

Nest #AFH24913403 was constructed on August 12, 1987 to enhance ferruginous hawk nesting opportunities northwest of Rawlins, in the Stewart Creek area where many nests have been constructed on large sagebrush plants. When we first checked this year on April 28, we found the nest active. Two adults were defending the territory. When we returned on June 03 to check ages and numbers of young, we found 3 nestlings ranging from 7 to 11 days old. We scheduled our return for June 30 when we banded the 3 young.

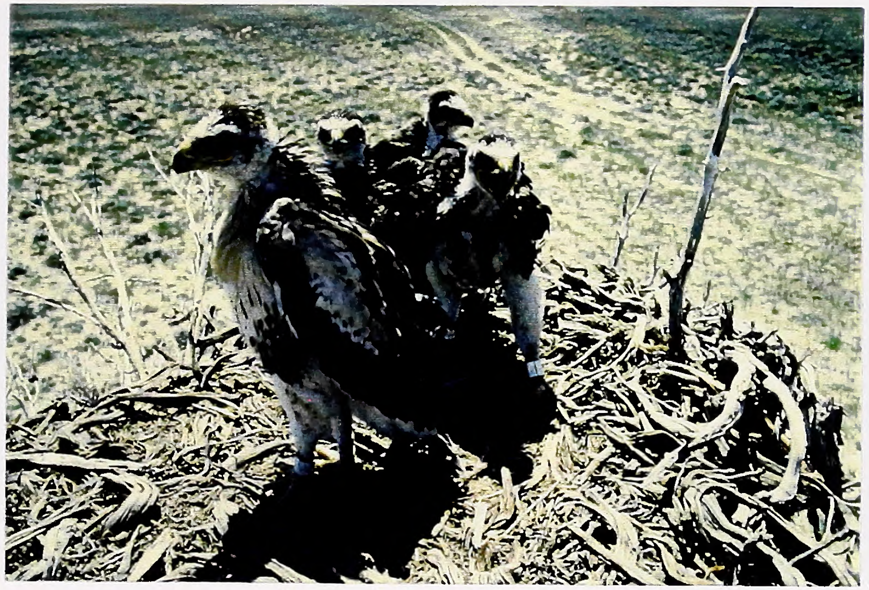
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH24913403	FH 3Y	FH 1Y	FH 3Y	FH 2Y	IA	FH 2Y'	?	IA	IA	FH 1Y'	FH 3Y'					Chicken Spring	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH25912802

Nest #AFH24913403 was constructed on August 12, 1987 to enhance ferruginous hawk nesting opportunities northwest of Rawlins, in the Stewart Creek area where many nests have been constructed on large sagebrush plants. This nest has been fairly inconstant in its use over the years. However, when checked on April 28 of this year, it was thought to be active. On June 11, when we returned to check age and number of young we confirmed that the structure was active with 4 young from 15 to 19 days old. We banded these four young on June 30, 1998. Notice that the three young in background are each dark morph nestlings.



INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH25912802	-	FH 3Y	FH 2Y	IA	FH 4Y	IA	?	IA	FH 1Y'	IA	FH 4Y'					Chicken Spring	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH15920503

Nest # AFH15920503 was constructed on August 27, 1991 to replace a continually unsuccessful natural nest (FH15920502). This structure was first checked on April 27 this year, when it was found to be active. We suspected that the female was incubating eggs. We returned on June 08, but as close as 20 yards, the female refused to leave the nest so we could not determine the number or ages of eggs/young . On June 10 and again on June 29, she was still incubating, but we were able to determine that there were 3 eggs. Because of the lateness of the season, we did not feel that the eggs would hatch. We checked again on July 27, and the nest had been abandoned, but surprisingly, none of the 3 eggs remained. (The overview photo did not turn out, so the photo below is from last year.)

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH15920503	-	-	-	-	IA	?	?	FAILED	FH 3Y'	FH 4Y'	FH 3Y FAILED					Mexican Flats	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

FH15921601

Nest # FH15921601 is a very secure natural nesting site for ferruginous hawks. This nest was first located in 1980, and both ferruginous hawk and golden eagles have nested on this formation. However, there has been a very incomplete record of activity at this nest since 1980. The nest was active in 1998, and there were 4 nestlings produced. The nest was surveyed on June 29, and again on July 01. No young were banded because of the height of the formation. A photograph was taken of the nestlings, but it was underexposed, and was unusable. This nest will continue to be monitored in the future. The formation in this photo is 45-50 feet high.

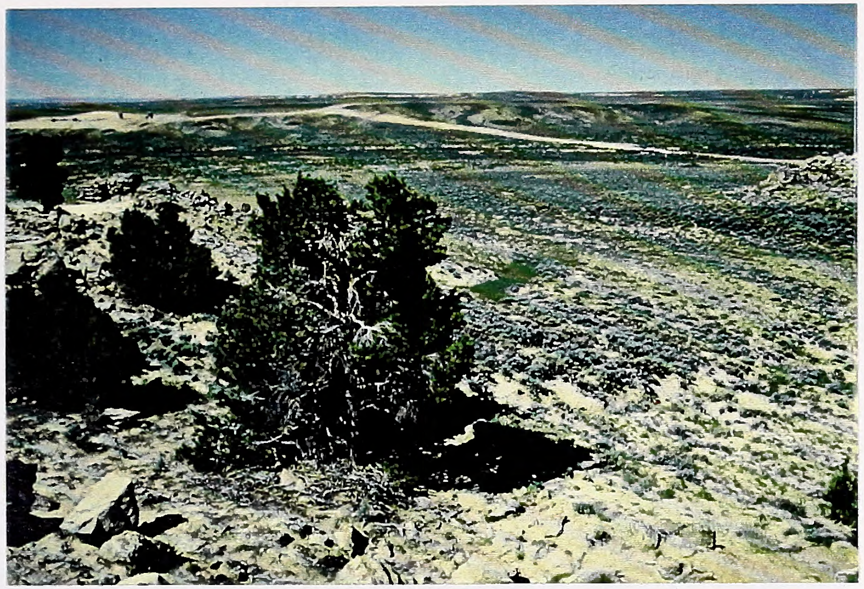
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

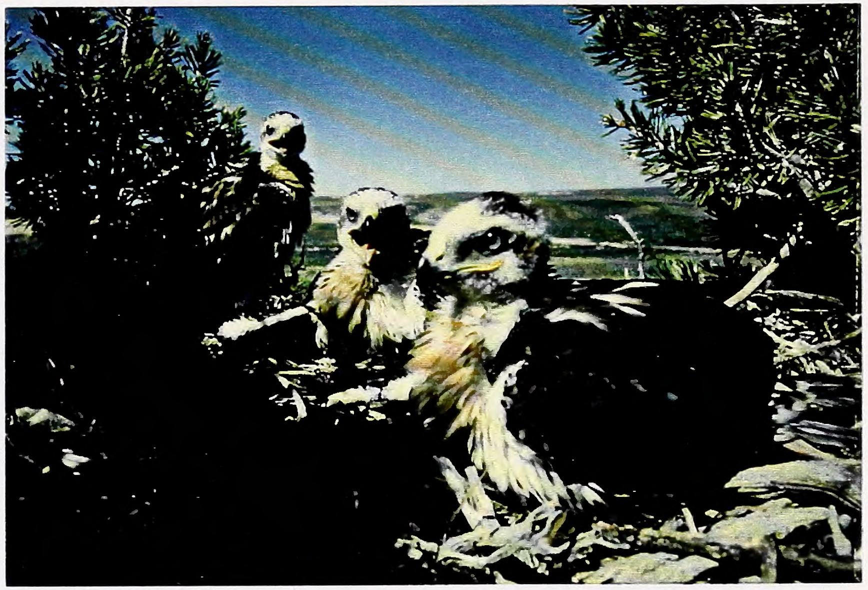
BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH15921601	?	?	?	?	?	?	?	?	?	?	FH 4Y					Bush Lake	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; * = Birds Banded.

FH17921002

Nest # FH17921002 was added to the raptor inventory in 1980. It was found to be inactive that year. It was again inactive in 1981, but not surveyed again until 1986. That year it was active, but no productivity data were collected. In 1988 the nest was used by a pair of golden eagles but no numbers of young were recorded. The nest was not surveyed until this year as part of the intensive raptor inventory/monitoring effort in the Continental Divide/Greater Wamsutter II EIS Area. It was surveyed on May 12, 1998 and found to be active. The young were aged on June 15, 1998 and 4 young nestlings were banded on June 29. 1998. This is a beautiful ferruginous hawk nest almost at the top of the canopy of the juniper tree. One Wyoming ground squirrel was in the nest. The fourth young in the photo below is in the deep shadow at the lower left hand corner.





INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH17921002	GE ?Y	?	?	?	?	?	?	?	?	?	FH 4Y'					High Point	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH18921801

Nest # AFH18921801 was built on August 16, 1993 to replace FH18921802 which was built on and later removed from a condensation tank at Snyder oil Co. Well # 1-18 (Lease # W-38437). This nest has been very productive and has been active every year that it has been available for use. This year the nest was determined active as early as March 20, when an adult was noted perched on the nest. On May 29, an adult was again perched on the nest, but no young or eggs could be seen. On June 08, when the nest was checked again, we got a huge surprise when we discovered 5 young in the nest ranging from 11-15 days old. This is only the sixth time in the past 10 years that we have observed a ferruginous hawk nest with 5 young. These five nestlings were banded on July 01, 1998.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH18921801	-	-	-	-	-	-	FH 4Y'	FH 1Y'	FH 4Y'	FH 3Y'	FH 5Y'					High Point	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH21923002

Nest # AFH21923002 was located here on August 22, 1991, to attract a nesting pair of ferruginous hawks away from FH21923001, a ground nest which had been predated in the past. The first time this structure was checked this year was during sage grouse lek surveys on March 24, 1998. It was thought to be active because one adult was observed perched on the structure. The activity status was confirmed on April 15, when we noted that the female was incubating eggs. On June 10, 3 young were noted and their ages ranged from 9 to 12 days. We returned on July 06 and banded these 3 nestlings. One flew away, but landed about 200 yards to the west. This nestling was retrieved and returned to the nest after it was banded.

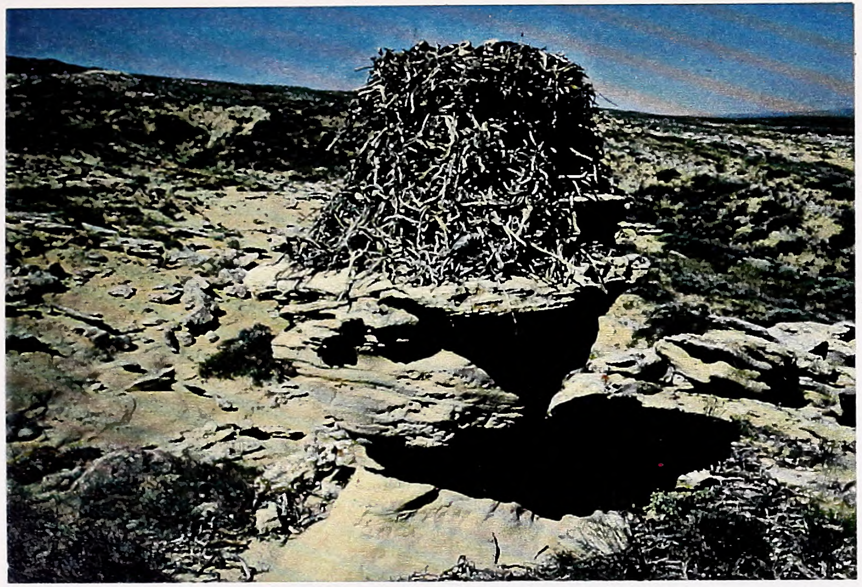
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

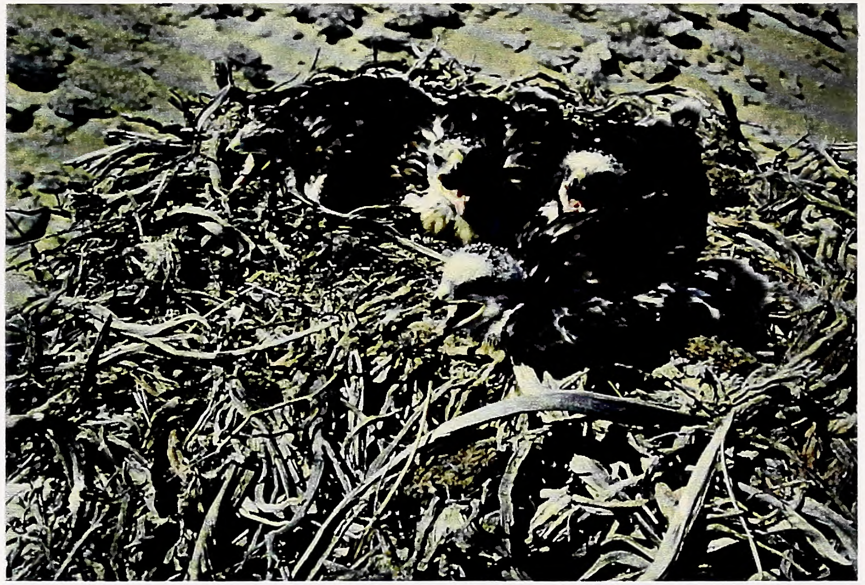
BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH21923002	-	-	-	-	IA	FH 2Y'	IA	FH 3Y'	FAILED	FH 3Y'	FH 3Y'					Ruby Knolls	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

FH22922703

Nest # FH2292703 is a beautiful example of ferruginous hawks selecting a secure nesting site. This nest was first located in 1986 when it had 2-3 young in it. It has not been monitored until this year. As part of the intensive raptor inventory/monitoring project in the Continental Divide/Greater Wamsutter II EIS Area effort, this nest was checked on June 09, and we found it was active. The young were aged on June 25, and on July 01, 1998 4 nestlings were banded. Judging by its size, remoteness, and difficulty to find, it is likely that this nest has been acive in past years.





INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH22922703	?	?	?	?	?	?	?	?	?	?	FH 4Y'					Ruby Knolls	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH23920801

Nest # AFH23920801 was constructed on September 1, 1988 to enhance ferruginous hawk nesting opportunities in the Chain Lakes area. This structure is in a seemingly unproductive area where you would not expect to find a sufficient prey base, but contrary to what it may seem, this nest has been one of the most productive and active yet erected. The nest was first checked this year on April 28, and adults were present. On June 03 it was rechecked and 4 young were observed, approximately 5 to 7 days old. The adult male appeared to be a dark morph. When we returned to band the four young on July 02, 1998 we confirmed that the male was a dark morph, and the two youngest nestlings were also dark morphs.

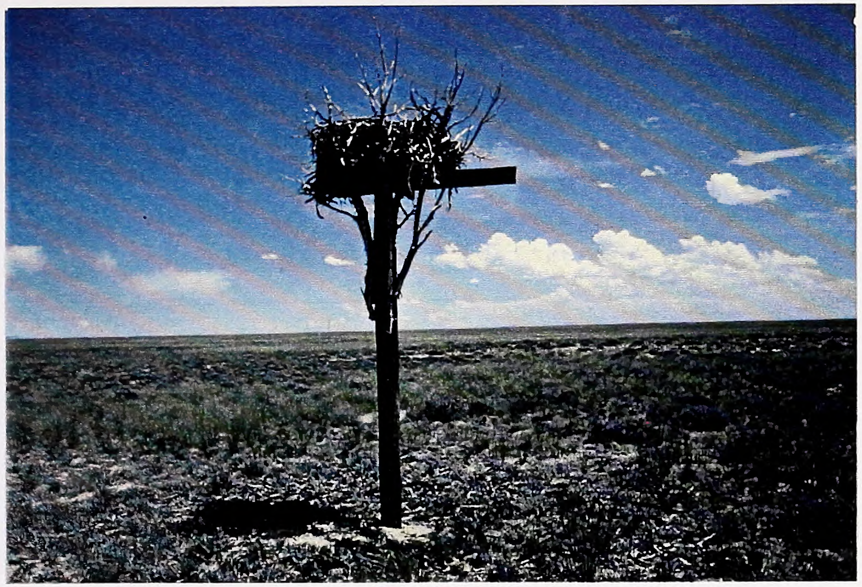
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

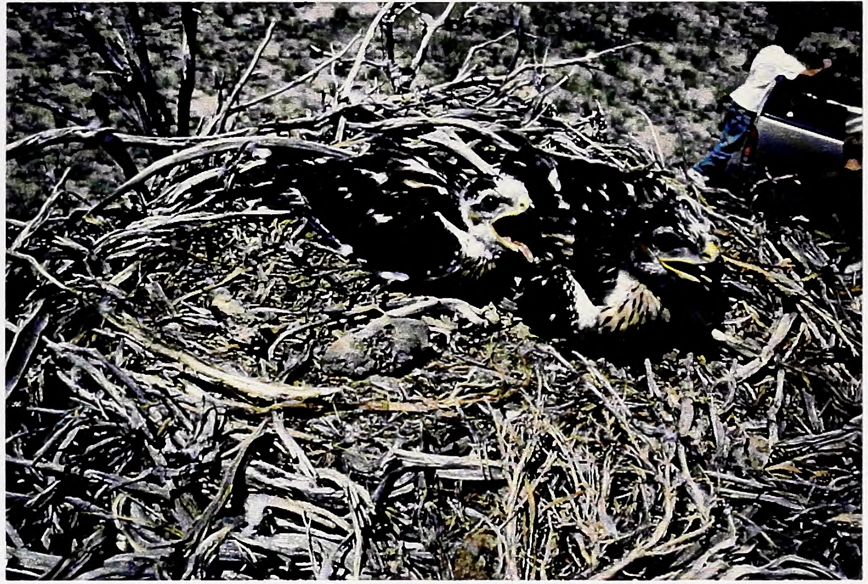
BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH23920801	-	FH 2Y	FH 3Y	FH 3Y	FH 3Y	FH 1Y'	FH 3Y'	FH 2Y'	FH 3Y'	FH 1Y'	FH 4Y'					Hansen Lake NE	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH24920501

Nest #AFH24920501 was constructed on August 31, 1988 to enhance ferruginous hawk nesting opportunities northwest of Rawlins, in the Stewart Creek area where many nests have been constructed on large sagebrush plants. Nests built on sagebrush typically are not secure and do not last very long. We first checked this structure this year on April 29 when an adult (most likely the female) flushed from the nest when we were no closer than ½ mile away. We returned on June 11 to find 2 nestlings, ages 12-14 days, defended by two adults. These 2 nestlings were banded on July 03, 1998. Note the prairie vole in the nest.





INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH24920501	-	IA	FH 4Y	IA	FH 4Y	FH 2Y'	IA	IA	FAILED	FH 3Y'	FH 2Y'					Sooner Reservoir	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH24921801

Nest #AFH24921801 was constructed on August 30, 1988 to enhance ferruginous hawk nesting opportunities northwest of Rawlins, in the Stewart Creek area where many nests have been constructed on large sagebrush plants. Nests built on sagebrush typically are not secure and do not last very long. When we first checked this nest on April 15 this year, we could not be sure that the nest was active. One adult was on the ground and as we watched, it flew away and returned to the ground near the nest. We returned later, on April 29 and confirmed that the nest was in use. On June 11, we checked the nest and found 3 nestlings from 15 to 19 days old. On June 30 we banded these 3 young hawks.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH24921801	-	FH 1Y	FH 1Y	FH 3Y	FH 3Y	FAILED	IA	FH 2Y'	FH 2Y'	IA	FH 3Y'					Sooner Reservoir	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH25922802

Nest #AFH25922802 was constructed on August 29, 1988 to enhance ferruginous hawk nesting opportunities northwest of Rawlins, in the Stewart Creek area where many nests have been constructed on large sagebrush plants. Nests built on sagebrush typically are not secure and do not last very long. For whatever reason this nest has been inactive more often than it has been active, and has been abandoned often when it has been active. Fortunately this year, it was active and successful. It was first checked this year on April 29 when an adult was observed to flush from the nest at ½ mile distance. Two young birds (17-19 days old) were observed on June 11, and on June 29 they were banded. Note the prairie dog in the nest.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH25922802	-	FH 3Y	IA	FAILED 3E	FH 1Y	FAILED	IA	IA	FAILED	FAILED 1E	FH 2Y'					Sooner Reservoir	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH25923203

Nest #AFH25923203 was constructed on September 02, 1988 to enhance ferruginous hawk nesting opportunities northwest of Rawlins, in the Stewart Creek area where many nests have been constructed on large sagebrush plants. Nests built on sagebrush typically are not secure and do not last very long. We tentatively determined that this nest was active when first checked this year on April 29. There was an adult seen flying in the area. On June 11 when we returned to confirm the activity status and age/number of young, there were three adults present and 4 eggs in the nest. The female was still incubating the eggs. On June 30, the adults had abandoned the nest, and the 4 eggs remained. They were most likely infertile.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH25923203	-	FH 3Y	FH 1Y	FH 3Y	FH 3Y	FAILED	IA	FAILED 2E	IA	FH 3Y'	FH 4E FAILED					Sooner Reservoir	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH25923502

Nest #AFH25923502 was constructed on March 18, 1991 to replace an old nest on an inactive windmill. The windmill nest had been removed and the nest was no longer available. This nest was active the first two years it was available and either was inactive or failed every year until this year. We first checked this nest this year on April 29 and it was active. When we returned on June 11, there were 2 young between 11 and 15 days old on the nest. These two nestlings were banded on July 2, 1998.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH25923502	-	-	-	FH 3Y	FH 2Y	FAILED	IA	IA	IA	IA	FH 2Y˚					Sooner Reservoir	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ˚ = Birds Banded.

FH16930201

Nest # FH16930201 is one of several nests built this year on condensation tanks. It is likely that this is the first year for this nest, but since no one has reported it here before this year, it has no history prior to 1998. The female laid 2 eggs and abandoned the nest, for an unknown reason. There was some minor disturbance caused by the pumper at the well, but the oil company contacted BLM as soon as they determined that the hawk was nesting on the tank. Prior to the nest being abandoned, one egg rolled off the tank. When the nest was checked on May 29, 1998, the adult was present (not on the nest), and 1 egg was in the nest. When checked again on June 08, the nest was abandoned, and no ferruginous hawk was observed anywhere in the area. An artificial nest may be placed in the vicinity of this tank this fall to attract the pair away from the tank in 1999.

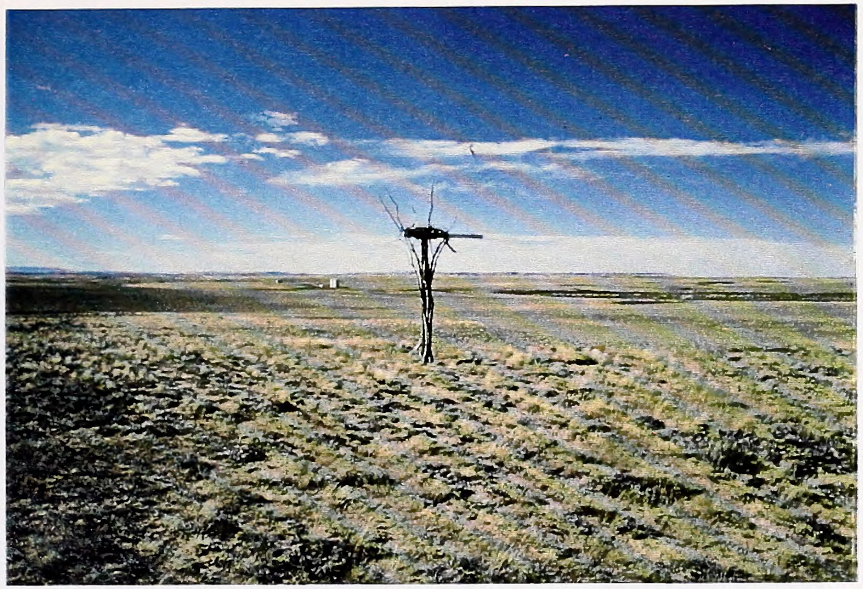
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH16930201	?	?	?	?	?	?	?	?	?	?	FH 2E					Duck Lake	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ° = Birds Banded.

AFH17931002

Nest # AFH17931002 was constructed on October 16, 1995 as mitigation for the loss of a natural nest built on a condensation tank at Amoco's Coal Gulch "F" well. It has been used every year since it was first available in 1996. AFH17931002 was first checked this year on March 20 in conjunction with sage grouse lek surveys and 2 adults were noted perched on the perch arm of the structure. The nest was confirmed active on May 29 and on June 08, 3 young were observed in the nest. They ranged from 22 to 24 days old. We returned to band these 3 nestlings on June 23, 1998.



INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH17931002	-	-	-	-	-	-	-	-	FH 3Y'	FH 4Y'	FH 3Y'					Duck Lake	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH17931402

Nest # AFH17931402 was constructed on October 20, 1995 as mitigation for the loss of a natural nest built on a condensation tank at Amoco's Coal Gulch "J" well. This structure was on the ground (badger digging at the base of the pole) in 1997 and the pair had nested back on the condensation tank at Coal Gulch "J" well. In the fall of 1997 we re-erected AFH17931402 and in 1998 it was active again. We first checked it on March 20 following sage grouse lek surveys, and later confirmed that it was active on May 29. We found 3 young in the nest on June 08 and they were approximately 17 days old. On June 29, 1998 we banded these 3 nestlings.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH17931402	-	-	-	-	-	-	-	-	FH 3Y'	IA	FH 3Y'					Duck Lake	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

FH17931501

Nest # FH17931501 was built initially in 1993 on this condensation tank. It successfully produced 3 young and these birds were banded. In the fall of 1993, the nest was removed from this tank and an artificial nesting structure (# AFH17931601) was constructed approximately 300 yards to the northwest of the tank. AFH17931601 was used from 1994 through 1997. This year the ferruginous hawk pair decided to once again build on the condensation tank. We later found that a pair of magpies had built a nest just below the nesting platform and between the central pole and the nest limbs on the artificial nest. This may have convinced the hawks to build on the tank again. The nest was first noted active on May 27, the young were aged on June 08, and 4 nestlings were banded on July 01, 1998. This particular pair of adults is the most defensive and aggressive of any pair we have encountered in 6 years of banding.

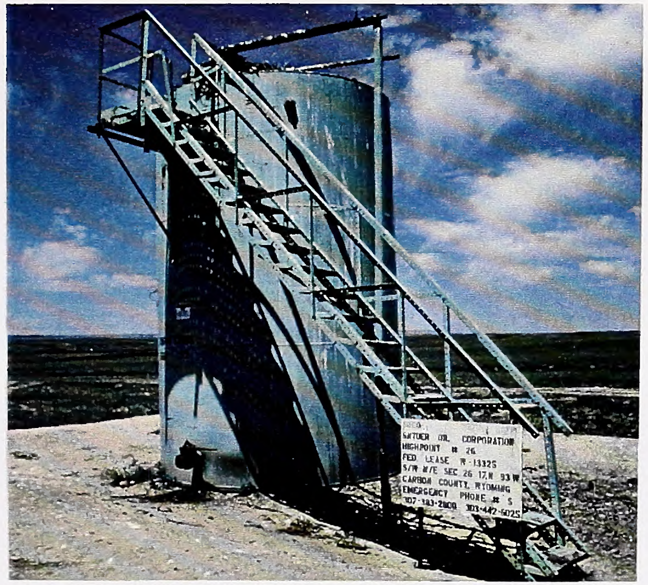
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

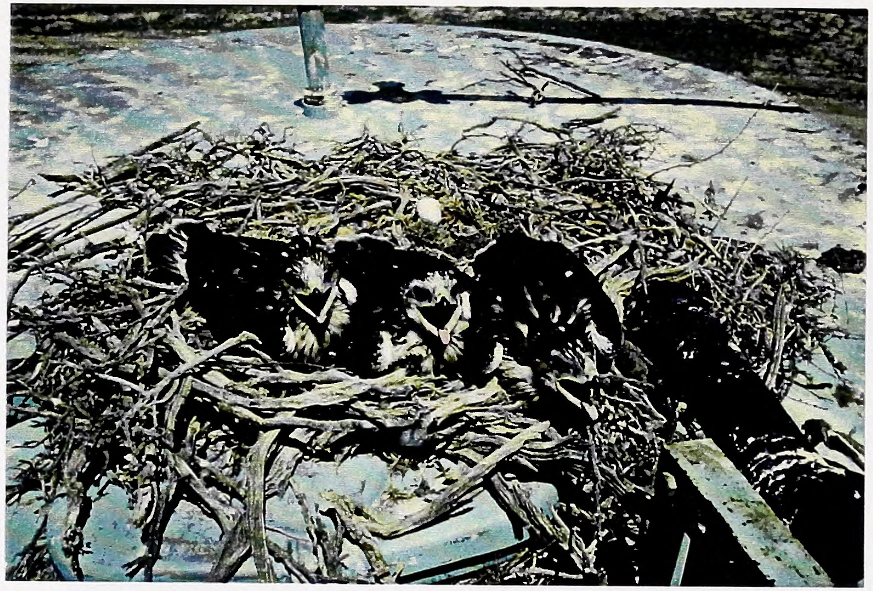
BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH17931501	?	?	?	?	?	FH 3Y˙	?	?	-	-	FH 4Y˙					Duck Lake	Replaced by AFH18921801 on 08-13-93.

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ˙ = Birds Banded.

FH17932601

Nest # FH17932601 was first noted this year. This condensation tank has been here for many years, and if the nest had been active here in previous years, the company would likely have let BLM know. This is probably the first year for this nest. The condensation tank is scheduled to be removed from this site this year, so this location is a candidate for an artificial nesting structure this fall to attract the birds when they return in 1999 and find their nest substrate gone. The nest was found on May 27, the nestlings were aged on June 10, and 3 young were banded on July 03, 1998. The female was relatively defensive and aggressive at this nest. Notice that there is an unhatched egg in the nest.





INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH17932601	?	?	?	?	?	?	?	?	?	?	FH 3Y*					Duck Lake	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; * = Birds Banded.

AFH18930601

Nest # AFH18930601 was constructed on October 11, 1994 as mitigation for the loss of a natural nest built on a condensation tank at Amoco's Champlin 222 well. This is the only nest that we know to have been vandalized since we began to use artificial nests. In the fall of 1996 we noted that all of the nesting material (sagebrush sticks) had been removed from the nesting platform. We built a new nest and placed it on the platform and it was again used in 1997. We first checked this structure this year on March 20 in conjunction with sage grouse lek surveys. Two adults were on the nest suggesting that it would again be active in 1998. The female was incubating eggs when we rechecked the nest on April 16, and on June 08, we observed 4 nestlings, ranging from 15 to 19 days old. These young birds were banded on June 29, 1998.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH18930601	-	-	-	-	-	-	-	FH 4Y'	FH 2Y'	FH 3Y'	FH 4Y'					Eight Mile Lake	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AGE18931601

Nest # AGE18931601 was constructed by Amoco on February 02, 1988 to relocate a nesting pair of golden eagles from Amoco's Champlin 261H well. This nest has been used by golden eagles and most frequently by ferruginous hawks. The structure is too high to band the young from, but we monitor the activity there anyway. We saw 2 adult ferruginous hawks perched on the structure on March 20 returning from sage grouse lek monitoring. An aerial observer reported that the nest was inactive on April 16, but when the nest was checked again on June 08, it was definitely active. On June 15 a minimum of 3 young were seen on the structure, but there is a possibility that there were 4 young raised from this nest.

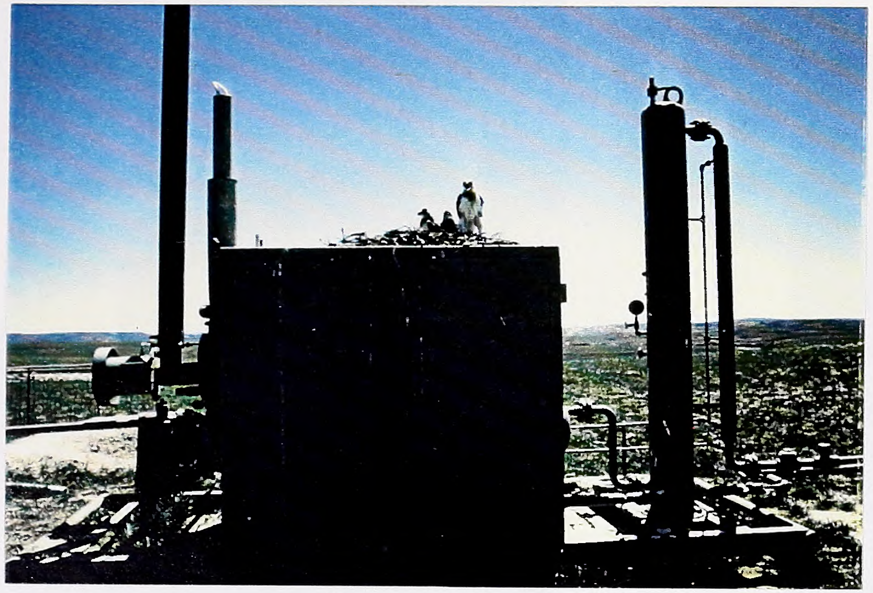
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

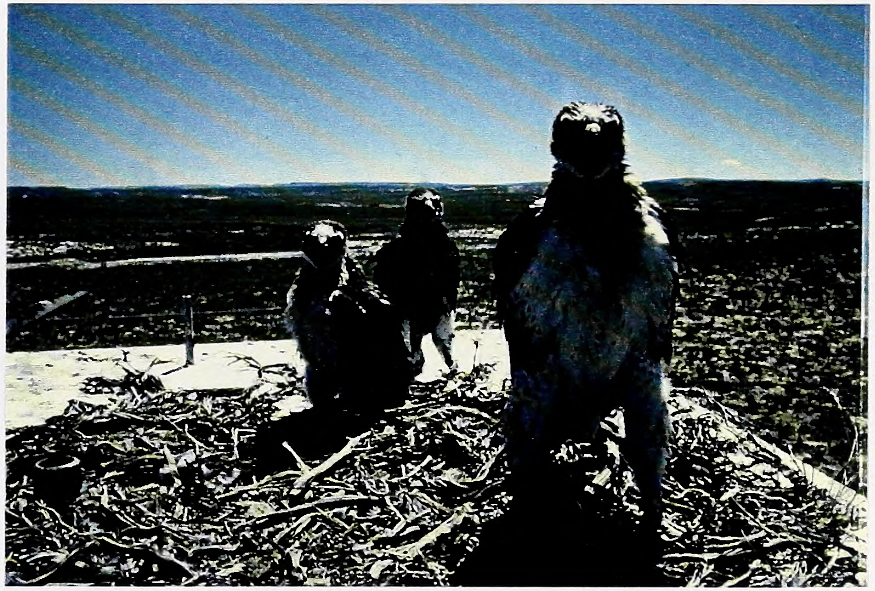
BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AGE18931601	FH 3Y	GE 3Y	GE 1-2Y	IA	IA	IA	IA	FH 2Y	FH 2Y	FH 2Y	FH 3Y					Eight Mile Lake	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

FH18932401

Nest # FH18932401 was reported by Dave Soule, BLM Petroleum Engineer Technician, on June 14, 1998 while inspecting oil and gas facilities. We immediately checked the nest on June 15 to determine the age of the young. This is the only nest we have located to date on a gas facility other than a condensation tank. We returned on June 29, 1998 to band 3 young birds. One of the nestlings was a dark morph and the other 2 were light. Although not visible in the photo below, there was a prairie dog in the nest.





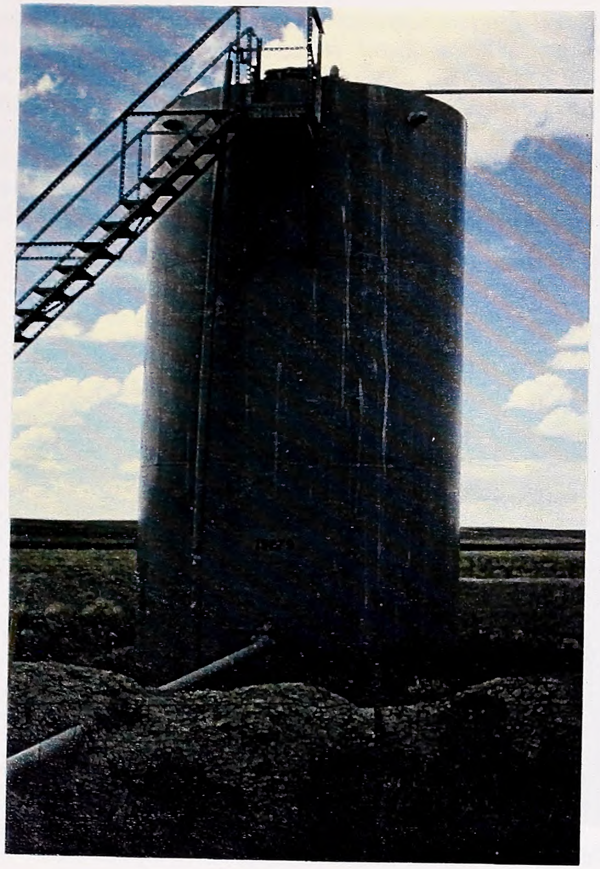
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

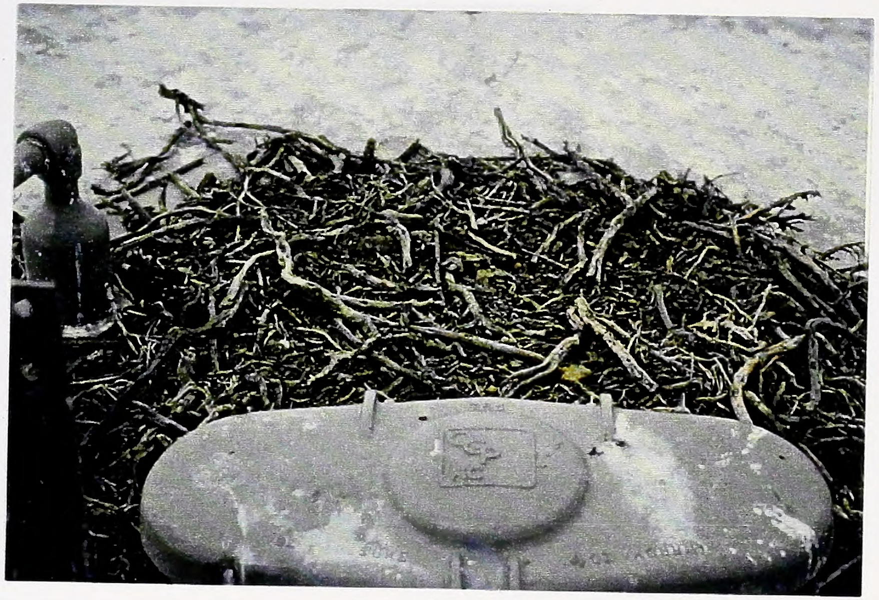
BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH18932401	?	?	?	?	?	?	?	?	?	?	FH 3Y'					High Point	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

FH18932901

Nest # FH18932901 was reported to BLM by Gary Sundburg of AMOCO Production Company after it was noticed on June 08, 1998. While this nest may have been built in a previous year, it is unlikely that it was, because of the frequency of pumper visits, and the level of cooperation we have with AMOCO. Three nestlings were first observed on June 08 when they were estimated to be 21-24 days old. On June 22, 1998 the three nestlings were banded. Photos were taken but they were overexposed and are not usable. The photos shown below were taken on July 27, after the young had fledged.





INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH18932901	?	?	?	?	?	?	?	?	?	?	FH 3Y'					High Point	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AGE19933302

Nest # AGE19933302 was constructed by Amoco and BLM on March 13, 1990 as mitigation for the loss of natural nest GE19933301 built on a condensation tank at Amoco's Champlin 222G well. The structure was checked on March 20, 1998 after sage grouse lek surveys and thought to be active. One adult was perched on a power pole near the structure. The nest status was confirmed on June 08 when at least 2 young were seen on the nest platform. The nest was visited again on June 15 and 4 young were confirmed and to our great surprise and delight, one of the adults was observed with a white plastic leg band, indicating that we had banded this bird as a nestling previously within the Great Divide Resource Area. This is the first time we have seen a plastic leg band on any adult ferruginous hawk since banding of nestlings began in 1993. The nest is too high to band young from, so none of the young were banded.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AGE19933302	-	-	IA	GE ?Y	IA	GE 2Y	IA	IA	IA	FH ?Y	FH 4Y					Eight Mile Lake	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

FH17940603

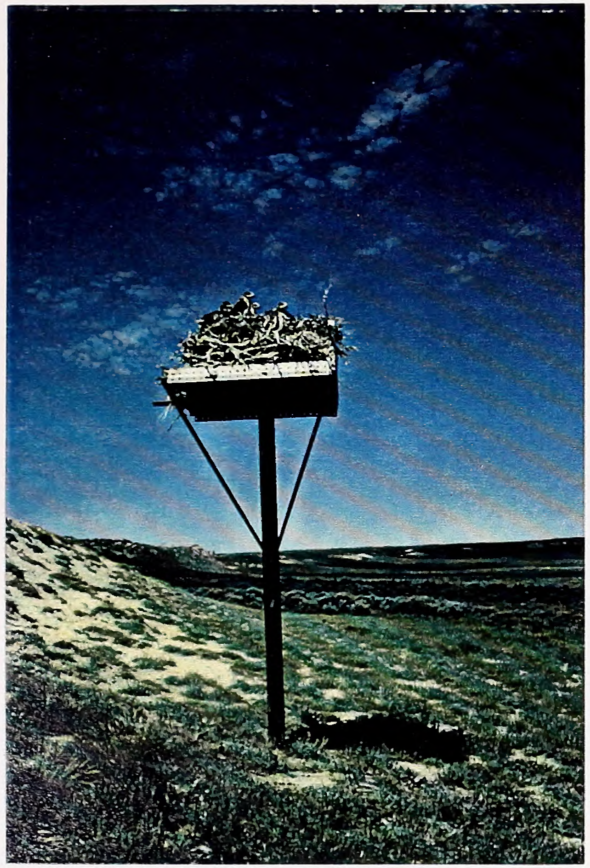
Nest # FH17940603 was added to the inventory in 1981, but since then has only been surveyed in 1992 when it was found to be active, and in 1998 when it was again active. This is a very typical ferruginous hawk nest, built on a high point, with a complete 360° field of view. However it is relatively easily approached and is vulnerable to any ground predator. This nest was surveyed on May 29 and the female was incubating eggs. On June 10 the nest was visited to determine the ages of the nestlings and three young hawks were estimated to be from 9-12 days old. When the nestlings were roughly 36 to 39 days old (and not likely to have fledged) the nest was visited again to band the birds. No adults and no young birds were present, there was no evidence of predation, or that the young had been taken by falconers. There were no clues as to the whereabouts of the young or adults.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH17940603	?	?	?	?	FH ?Y	?	?	?	?	?	FH 3Y' FAILED					Mexican Flats NW	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH21940303



Nest # AFH21940303 was built by Amoco on February 10, 1988 as mitigation for the loss of a natural nest on a condensation tank (Siberia Ridge #5). This nest, like AFH21940302, was constructed entirely of metal, rather than the more common wood. It is similar in design to the golden eagle artificial nesting structures, but it is only 8 feet tall. We first visited the structure this year on May 01 and it was active. A female was incubating eggs. When we checked the nest again on June 03, there were 4 young estimatedat 7 to 11 days old. These 4 nestlings were banded on June 30, 1998. One Wyoming ground squirrel was in the nest (not visible in this photo).

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH21940303	IA	IA	GE 2Y	?	IA	IA	IA	IA	FH 4Y'	FH 3Y'	FH 4Y'					Dennison Cap	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH21941203

Nest # AFH21941203 was constructed on October 24, 1996 as mitigation for the anticipated loss of a natural nest located too closely to a proposed Union Pacific Resources Corporation well. The well was relocated from it's original proposed site. The natural nest continues to be unused, but this structure has been used both years it has been available. It was first visited this year on May 01 and was active. The female was incubating eggs and flushed when we were within about ¼ mile. On the second visit, on June 03, we confirmed that 2 young were present and they ranged from 7 to 11 days old. These two nestlings were banded on June 30, 1998. (The nest overview photo did not develop well enough to use.)

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH21941203	-	-	-	-	-	-	-	-	-	FH 3Y'	FH 2Y'					Monument Lake	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH22942404

Nest # AFH22942494 was constructed on August 31, 1988 to attract a nesting pair of ferruginous hawks away from a condensation tank. We first checked this location this year on May 01. It was active with 2 adults present. When we rechecked the structure on June 03 we confirmed that there were 4 young between the ages of 7 and 13 days. On June 29, 1998 these four nestlings were banded. One nestling flew off of the nest about 150 yards away. It was retrieved and returned to the nest.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH22942404	-	FAILED	FH 2Y	IA	FH 4Y	FH 3Y'	FH 4Y'	FH 3Y'	FH 4Y'	FH 3Y'	FH 4Y'					Monument Lake	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH23942802

Nest # AFH23942802 was constructed on October 13, 1994 as mitigation for the loss of a natural nest built on a condensation tank at an Amoco well location. This structure has been active every nesting season it has been available for use. It was checked for the first time this year on April 29 and was found to be active. We rechecked it on June 03 and there were 4 nestlings, 7 to 11 days old. We returned on July 01, 1998 to band these four young. There were, in addition to the 4 nestlings, 8 (EIGHT!!) Wyoming ground squirrels in the nest.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH23942802	-	-	-	-	-	-	-	FH 4Y'	FH 4Y'	FH 3Y'	FH 4Y'					Lost Creek Butte	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH23953203

Nest # AFH23953203 was built August 31, 1988 as mitigation for the removal of a natural nest from a condensation tank at a Kaiser Francis Oil Company well. Since then, the well location has been abandoned and reclaimed. This structure has been a very productive nest especially since 1993. We first checked the nest this year on May 01 and it was active. We counted 2 nestlings estimated at about 11 days old on our next visit on June 03. We returned on July 01 and banded these 2 young hawks. (We failed to take photographs at this nest!)

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH23953203	-	IA	FH 2Y	FH 3Y	IA	FH 4Y'	FH 4Y'	FH 4Y'	FH 4Y'	FH 4Y'	FH 2Y'					Lost Creek Butte	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH25950801

Nest # AFH25950801 was constructed on August 10, 1987 to enhance ferruginous hawk nesting opportunities in the Cyclone Rim area where nesting attempts occur, but few successful nests exist. Since being first available for nesting in the spring of 1988, this nest has been active every year. Only in 1992 did the pair produce eggs and later abandon the nest. Young have been produced every other year including this year. We first looked at this nest on April 29, and returned on June 23 to determine number and ages of young. There were 2 young from 15 to 17 days old. These 2 young were banded on July 08, 1998.

INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH25950801	FH 4Y	FH 3Y	FH 3Y	FH 3Y	FH 2E	FH 2Y'	FH 3Y'	FH 2Y'	FH 2Y'	FH 2Y'	FH 2Y'					Cyclone Draw	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; · = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH25953502

Nest # AFH25953502 was constructed on August 10, 1987 to enhance ferruginous hawk nesting opportunities in the Cyclone Rim area where nesting attempts occur, but few successful nests exist. The structure has seen relatively consistent use since then. We first checked the status of this nest on April 29 and found it to be active. On our return to the nest on June 11, we confirmed that 1 nestling about 14-15 days old was present on the nest. This nestling was banded on our final visit, July 02, 1998.

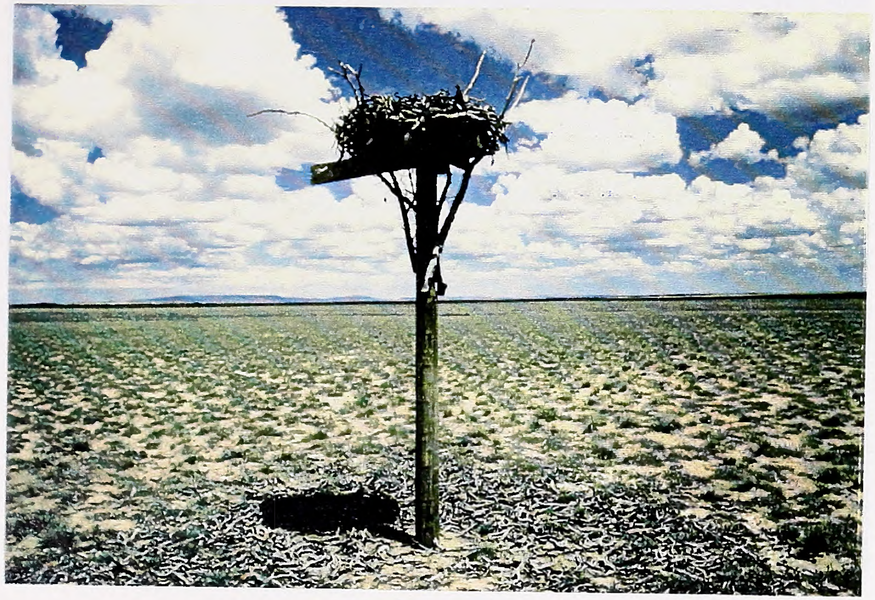
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

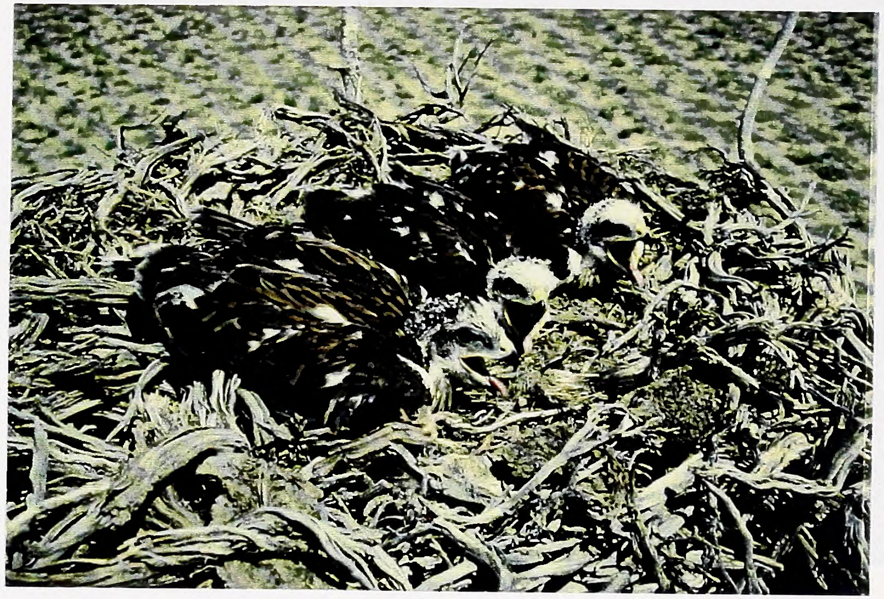
BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH25953502	IA	FH 3Y	FH 3Y	FH 3Y	FH 3Y	FH 1Y'	FAILED 1E	FH 3Y'	IA	FH 1Y' 2E	FH 1Y'					Lost Creek Lake	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; · = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH26952901

Nest # AFH26952901 was built on November 08, 1993 to mitigate the loss of a natural ferruginous hawk nest located on a pipeline pumping station facility. This is a very isolated location, and there are few good nesting sites in the area which are both secure and successful. This nest has been very successful since it's first available nesting season of 1994. It has been used every year since then, including this year. We first checked this nest on April 29 and indeed, it was active. We tried to visit the nest on June 11, but severe thunder storms kept us from the area. We returned, prepared to band the young on June 23, and indeed, had to band the three nestlings on that date. They were from 33 to 38 days old.





INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH26952901	-	-	-	-	-	-	FH 3Y'	FH 3Y'	FH 3Y'	FH 3Y'	FH 3Y'					Cyclone Draw	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

AFH23961302

Nest # AFH26951302 was constructed on August 01, 1989 as mitigation for the removal of a natural nest from a condensation tank at Kaiser Francis Oil Company Well # 793. Until this year, both adults at this nest have been dark morph. This year the male is dark and the female is light, and the four young are dark morphs. This nest was checked this year for the first time on May 01 and the nest was active. On the return visit on June 03 we found that there were 4 nestlings ranging from 9 to 15 days old. On June 25, 1998 these 4 nestlings were banded.

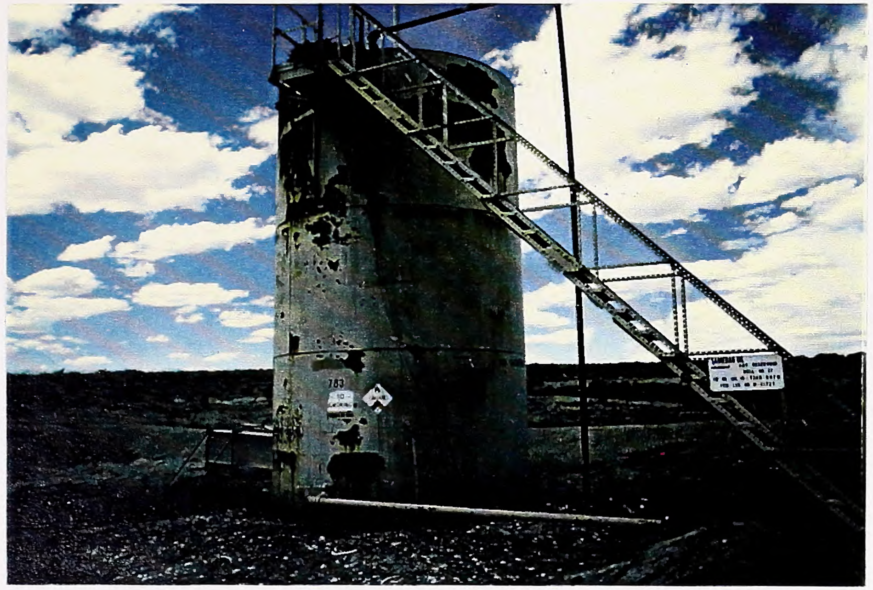
INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

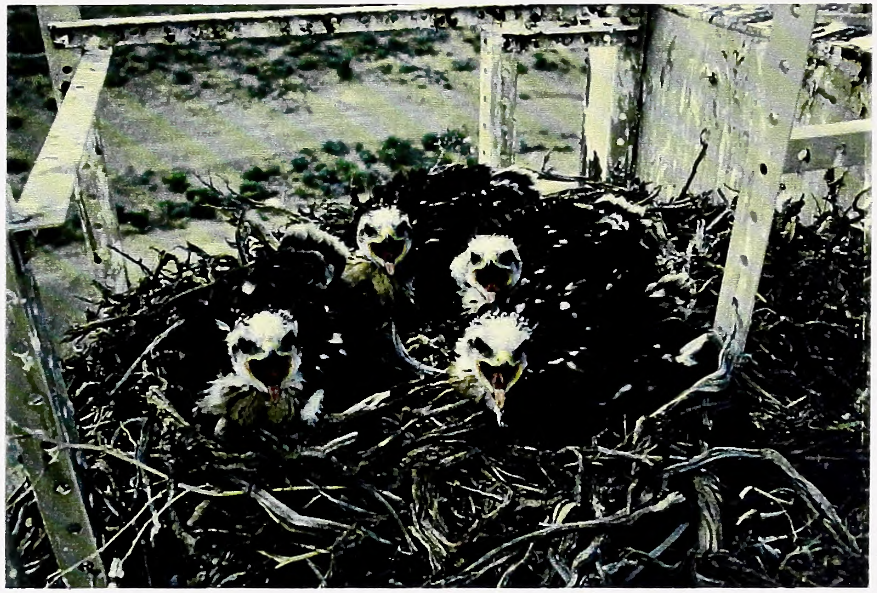
BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
AFH23961302	-	-	FH 3Y	FH 4Y	IA	FH 5Y'	FH 4Y	IA	FH 4Y'	FH 2Y'	FH 4Y'					Lost Creek Butte NW	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; - = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

FH24971001

Nest # FH24971001 was reported by Dave Soule, BLM Petroleum Engineering Technician on May 1, 1998. He discovered the nest on this condensation tank on a routine inspection of the well. Since this is a very old well, it is reasonable to assume that it has held a ferruginous hawk nest in past years, but no prior survey data exists. This well is scheduled to be abandoned and reclaimed shortly, so this area is a candidate for an artificial nesting structure. The ages of the young were estimated on June 03, and the 4 young were 9-15 days old. On June 25, 1998 the 4 nestlings were banded.





INDIVIDUAL NEST HISTORY SINCE PROJECT INCEPTION

BLM Nest Number	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	USGS Topo Map	Remarks
FH24971001	?	?	?	?	?	?	?	?	?	?	FH 4Y'					Bush Lake	

IA = Inactive; FH = Ferruginous Hawk; GE = Golden Eagle; Y = Young; E = Egg; · = Structure not constructed yet, or structure removed and relocated; ? = Nest Not surveyed this year; ' = Birds Banded.

4/12/0